THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—34TH YEAR. SYDNEY, SATURDAY, MARCH 1, 1947. No. 9.

Table of Contents.

ASIATIC SCHISTOSOMIASIS: AN OUTBREAK IN THE ROYAL AUSTRALIAN AIR FORCE.

By W. P. H. DAKIN,
Squadron Leader, Royal Australian Air Force Medical Service,

AND

J. D. CONNELLAN,
Flight Lieutenant, Royal Australian Air Force Medical Service.

DURING the latter part of 1944, members of a Royal Australian Air Force airfield construction squadron contracted Asiatic schistosomiasis. This article deals with the effects of this disease on the unit, and with the diagnostic methods and treatment used to control the outbreak.

After spending a short period of service in New Guinea and the Halmaheras, the unit, numbering approximately 565 men including attached personnel, joined an American task force bound for Leyte in the Philippines. Only sixteen days were spent ashore at Leyte, the squadron then making a "D-day" landing at Mindoro in the central Philippines, where the unit was employed building and then maintaining an airstrip over the next six months. During the sixteen days spent at Leyte the men were encamped on a sand-spit, with the open sea on one side and the Bislig River on the other, about half-way between the towns of Tolosa and Tanuan. Much spare time was spent by the men swimming and washing in the river, and all the clothes were washed in its waters. The Bislig River was later found to be heavily infested with *Schistosoma japonicum*.

The squadron left Leyte on December 10, 1944, and landed at Mindoro on December 15. From December 23 onwards, increasing numbers of men developed a sickness associated with fever, joint pains, cough and in some cases urticaria. By the end of January, 1945, it was realized that many men of the unit had contracted schistosomiasis, and a survey of all personnel was undertaken to ensure that no cases had been missed. At this period a large number of American personnel who had been in the Leyte landing had also developed the acute symptoms of Asiatic schistosomiasis. A few of the men were evacuated to southern hospitals, but the bulk of the infested men were treated as out-patients, and given treatment with "Fouadin". They endeavoured to carry on their work, but if too ill they were placed in the unit sick quarters.

During the month of May, 1945, a further review of some of the men in the unit was undertaken by the medical officer of the squadron in association with members of the United States Commission on Schistosomiasis headed by Dr. E. C. Faust. Later, in view of the discovery of some latent cases and of the finding that "Fouadin" had been inadequate as a complete cure, it was decided to withdraw the whole squadron to Australia as soon as possible and to investigate every member of the unit thoroughly, utilizing the Fairley complement fixation test as a check in the stool diagnosis.

It has thus been possible for us to follow up satisfactorily the medical records of 560 men. These records constitute the basis of this article.

In all, 226 men have received some form of treatment for schistosomiasis. Of this number 144 have been found to be excreting ova in the stools, and 169 gave positive results to the complement fixation test. In the original survey the diagnosis was based on history and physical signs and eosinophilia, the stool examinations being

unsatisfactory at this stage. Stool examination technique was greatly improved in later surveys.

Geographical Distribution.

Schistosoma japonicum occurs exclusively in the Far East, the principal localities being China, particularly the Yangste valley, Japan, Formosa, the Philippine Islands, and the northern part of the Celebes. In the Philippines the disease is endemic in Leyte, Samar, the northern tip of Mindoro and Mindanao. The part of Mindoro where the construction squadron worked was free from this disease.

Schistosomiasis in Australia.

It would be as well to mention briefly the history of schistosomiasis in this country, as the problem of the disease becoming endemic here has frequently arisen.

There have been no reports in the literature of the *Schistosoma japonicum* species occurring among Australian personnel. However, two previous wars, the South African War and World War I, have left a number of cases of the other two varieties of schistosomiasis in Australia.

Nelson[1] reported two cases, in 1912; the patients who had never been out of Australia, became infested with *Schistosoma hæmatobium*, the ova being found in the urine. These cases were reported from Greenbushes, Western Australia, where some months previously an ex-soldier from the Boer War had been diagnosed as suffering from the same disease. Snails in the district had apparently been capable of acting as intermediate hosts for the parasite.

During World War I many Australians contracted schistosomiasis in Egypt, and their repatriation to Australia was the cause of much investigation and discussion as to the possibility that the disease might become endemic in Australia. Cherry[2] (1917) pointed out the danger of introducing the disease to Australia, though attempts to infect local specimens of snails of the genera *Bulinus*, *Ancylus* and *Planorbis* were unsuccessful.

In 1920 it was reported that 45 affected patients had returned to the State of Victoria, the disease having been contracted in Egypt. McWhae and Jagger[3] (1921) reported the treatment with tartar emetic of 11 patients in Western Australia, Pavy[4] treated ten patients in South Australia, and Summons and Irving[5] (1921) treated 30 patients in Victoria, all these subjects having contracted the disease in the Middle East during the war. Clinically the majority of the patients were cured, though in some cases more than one treatment was given. These reports are the last that have been found to deal with cases from World War I, and it would seem that the conditions must have settled down, or it would be expected that further reports would have appeared in the journals.

Fairley and Fairley[6] (1929), reporting on four immigrants who came to Australia from Palestine, and later developed signs of schistosomiasis, pointed out that the disease might become endemic in Australia. They considered that an endemic focus in the country had been prevented only by the measures taken by the military authorities to control the disease, and by the general high standard of sanitation in rural areas.

Only one endemic case has been reported in Australia since World War I (Holland and Woodward[7]). This was at Grafton, in a child aged three years. The clinical history was atypical, and many atypical ova were found.

Milton[8] (1922) reviewed the possibility that schistosomiasis might become endemic in Australia.

Pathology.

Much work has been done on the life history of the schistosoma, and an outstanding description of the Japanese type is given by Faust and Meleney.[9]

Within a few hours of the ova's being passed in the fæces, the ova hatch and a free swimming form, the miracidium, is liberated. Upon reaching a snail of suitable species, the miracidium invades the soft tissues of the snail, where it undergoes development and multiplication. After several weeks numerous fork-tailed cercariæ emerge from the snail and swim near the surface of the fresh-water streams and ponds, and are capable, after dropping off their tails, of penetrating human skin. *Schistosoma japonicum* can infest other mammals, such as pigs, dogs, monkeys. After entering a suitable host, the cercariæ enter the peripheral veins and then pass through the pulmonary circulation and into the systemic arterial system. Those which reach the mesenteric capillaries pass through into the portal system, mature in the intrahepatic portions of the portal vein and then pass down against the blood-stream to settle down in the smaller branches of the mesenteric veins. Ova are deposited in the mucosa and submucosa of the intestinal wall. The worms settling in the systemic veins die out fairly quickly, but the worms in the portal system may live for many years. Almy and Harper[16] (1944) record a case in which the schistosoma must have survived for at least twenty-five years, and Fairley[17] (1931) records a case in which the duration of life of *Schistosoma hæmatobium* was approximately thirty years.

The effects of the infestation on the host are due to the presence of the worms, and of the ova which become retained in the tissues. Many eggs are retained in the walls of the intestine, others are washed back in the portal stream to the liver. The ova in the tissues give rise to a pseudo-tubercle with later the formation of a small fibrous nodule, and it is collections of these nodules which lead to cirrhosis of the liver in the later stages of the disease. Fibrosis also occurs in the intestinal walls, where irritation and deformity in late cases lead to chronic diarrhœa with accompanying emaciation.

Unusual locations of worms and ova may rarely produce lesions in organs away from the portal system.

Initial Clinical Features of Infestation.

The initial toxic symptoms of Asiatic schistosomiasis were described some years before a similar picture was found to occur with the other varieties of schistosoma. A good description was given by Edgar[10] as long ago as 1913, and a short note on the condition was given by Bassett-Smith[11] in 1912. More recently the initial illness has been described by Spiridion[12] as occurring in members of the Royal Navy, and cases occurring during World War II have been described by Hunt,[14] and by Johnson and Berry.[15]

In Egypt, Lawton[12] (1916) in an important contribution to this subject described similar symptoms in the initial stages of *Schistosoma mansoni* infestation in troopers of the Australian Light Horse stationed at Tel-el-Kebir, and Fairley[20] (1919) described similar early toxic symptoms of variable intensity and duration. These investigations in Egypt and others undertaken in Australia revealed that most of the military personnel infested in Egypt (including Lawton's series) harboured both species of parasite (*Schistosoma hæmatobium* and *Schistosoma mansoni*). The pathological basis of the early toxic symptoms was also worked out in detail by Fairley[21] (1920) in monkeys experimentally infested with *Schistosoma mansoni* or *Schistosoma hæmatobium*.

Early Symptoms.

The early symptoms are discussed with regard to 174 cases in which either ova were found or the complement fixation test gave a positive result. The report does not include 53 patients who were treated empirically with "Fouadin" because of eosinophilia but in whom no further evidence of infestation was found. Some of these probably had light infestations which were cured by early treatment; but as no proof of infestation was obtained, they are not included in this discussion.

Of the 174 patients, 72 had no early symptoms whatsoever. On close questioning later they failed to recall any marked disabilitiy at the time and all proceeded about their normal duty. This total of 41% of patients without symptoms stresses how early infestations can be easily overlooked.

Of the remainder, nearly all at some time or other had a history of an influenzal type of sickness characterized by

headache, aches and pains in the back and joints and general malaise.

Time of Onset of Symptoms.

The earliest onset of symptoms was noted in eight cases; these subjects reported ill on December 18, or twenty-four days after the earliest possible time of exposure. The majority reported with initial symptoms between December 23 and January 18—that is, thirty to sixty days after exposure. No patient reported with initial symptoms after a period of sixty-five days from exposure.

The Chief Symptoms.

Fever was a common feature of the disease. It was of the remittent type, the temperature generally being normal in the morning and rising towards the evening to 101° or 102° F. The average duration of the fever was five to seven days, in fifteen cases it lasted for fifteen to nineteen days, and in fourteen other cases it recurred for a period of two or three days after a week's quiescence.

General malaise and weakness were fairly common complaints. The men found that they felt moderately well in the mornings, but towards evening experienced great weakness. At this time the unit was striving against difficulties of constant bombing to make the airstrip serviceable, and many men who probably would have normally retired to bed endeavoured to keep working as well as they were able.

Aching and pain in the limbs were fairly constant accompaniments of the fever. Stiffness and pain in the neck were characteristic findings, and were present in 75% of patients with symptoms; in a few cases these were the most distressing symptoms.

Cough was frequent; it was harsh and unproductive and often persisted after the fever had subsided.

Urticaria was present in 27 cases, but was severe in only 12 of these.

Some gastro-intestinal symptoms were observed. Constipation was occasionally present during the attack of fever, but diarrhœa was not encountered in any case. Epigastric pain of an aching nature was frequently present in association with tenderness of the liver. Anorexia and loss of weight generally were present in patients with symptoms.

Physical Signs.

Tenderness over the liver with slight enlargement of that organ was fairly frequent during the initial fever. Tenderness of the spleen occurred less commonly. Leucocytosis with high eosinophilia was almost invariable; it is discussed separately later.

Stool Examination.

In the early investigations in the field the fæces were examined by the direct smear method. In only two cases were the ova discovered. The sedimentation method described later was not used in the early stages.

Course of the Disease over a Twelve Months' Period.

After the initial feverish attack, all the patients in the Royal Australian Air Force unit settled down and in a few weeks most regained their health completely. The observations on the course of the disease over the succeeding months are based on a series of 139 patients, of whom 103 had had unsuccessful "Fouadin" therapy, and 36 were patients who had been missed at the previous examinations.

One hundred and twenty-five of these men were still excreting ova ten to twelve months after infestation had taken place. The remaining fourteen had been treated with tartar emetic some six and a half months after infestation, with apparent cure.

The most outstanding feature was the lack of any clear-cut clinical syndrome. One hundred and eight men (77%) had no symptoms at all, stated that they felt perfectly fit, and in fact had been doing hard physical work in a tropical area right up to the time when their condition was diagnosed. The probability is that they would have been symptom-free for many more months. Apart from the finding of ova in the stools of this group, physical abnormalities were present in only eight of these symptom-free patients. Enlargement and tenderness of the liver were present in five cases, the liver being palpable in two cases from one to three fingers' breadth below the costal margin. Tenderness in the epigastrium was present in one case, and tenderness over the spleen in two cases.

The squadron had resided in numerous malarious areas, and though its members were still taking suppressive "Atebrin", enforcement of the taking of the tablets was much less strict after arrival in Australia. Therefore splenic tenderness could have been associated with subclinical attacks of malaria.

Thirty-one men had very mild symptomatology, the complaints in many cases probably being totally unrelated to the schistosomiasis. These men had also been doing heavy physical work in the tropics right up to the time of investigation.

Lassitude.

Lassitude was the commonest complaint, and was stated to be present in twelve cases. The tiredness had generally been present for many months, often dating back to the original febrile attack. The patient's statement of tiredness was generally accompanied by the remark that he did not feel at his best, though he was unable to say why.

Abdominal Pain.

Abdominal pain was present in eleven of the cases, was never definite and usually occurred only at odd intervals. Seven of the men suffered from attacks of pain unrelated to meals in the right hypochondriac and epigastric regions. Most commonly the pain was of an aching nature and occurred two or three times a week, lasting a few hours at a time. One patient had attacks of severe colicky pain over the region of the descending colon.

Two men had had attacks of pain in the right iliac fossa, the clinical picture simulating mild appendicitis. The possibility of confusing schistosomiasis with appendicitis has been noted in *Schistosoma mansoni* infestations (Begg).[am] Summons and Irving report a case in which the appendix was removed and examination of sections of the tissue revealed numerous ova of *Schistosoma mansoni*.

These abdominal symptoms all cleared up after treatment with tartar emetic.

Rheumatic Pains.

Aching and pain of a mild nature in the limbs and back were present in six cases; they had been noted in the preceding three or four months. It was difficult to assess the responsibility of the schistosoma infestation in the causation of these symptoms. Treatment with tartar emetic in most cases caused some degree of rheumatic pains, and the relief after treatment was such that the patients did not worry about any minor remaining aches.

Headache.

Headache was present in five cases; it was not continuous and never severe. It was usually stated to have developed from a severe headache at the time of the acute febrile onset of the disease.

Loss of Weight.

Any men doing heavy manual work in the tropics on army rations tend to lose weight. The men affected by schistosomiasis were no worse in this respect than the others.

Diarrhœa.

Only one patient suffered from diarrhœa, which had been present for many months since the start of his tropical tour. This persisted after treatment with tartar emetic. He was found to have a heavy infestation with hookworm, and after treatment for this condition the diarrhœa was relieved. Evidently in only long-standing or severe cases does the diarrhœal stage develop. Almost

3,000 stool examinations were made during the course of this investigation, and in only one case was blood noted macroscopically in a specimen of stool, and in that case on only one occasion. Numerous ova were present, but the patient had never had diarrhœa.

Abdominal Signs.

Abnormal physical signs among these 31 patients with mild symptoms were found in only nine cases. Tenderness in the right hypochondrium was present in four of these cases, and in two it was associated with a palpable liver one and three fingers' breadth respectively below the costal margin. Three patients had tenderness in the left hypochondrium, though the spleen was not palpable.

Tenderness in the right iliac fossa was elicited in three cases, while in a further case tenderness on deep pressure over the descending colon was present.

Discussion on Signs and Symptoms.

In this series of cases, once the initial febrile attack passed off the patients generally regained their full health. This constitutes a real danger, in that the men may be regarded as cured, whereas in actual fact a continual process of tissue destruction is quietly taking place, which if allowed to continue may produce the death of the patient after some years.

Sigmoidoscopy.

Bercovitz *et alii* report a proctological study of a group of Puerto Rican recruits found to be excreting ova of *Schistosoma mansoni*. They reviewed 155 young men who had no clinical symptoms, and found that 60·7% had minute visible ulcerations of the bowel. Bercovitz *et alii* also point out that the standard textbooks do not mention the large number of personnel infested with schistosoma who remain symptom-free. Johnson and Berry in their series found in 50% of cases firm yellow nodules one to three millimetres in diameter, most abundant at the recto-sigmoid junction; no ulceration was seen.

In May, 1945, 38 men of the Royal Australian Air Force construction squadron, previously untreated, were examined sigmoidoscopically by members of the United States Commission on Schistosomiasis, in conjunction with one of us. Stool sedimentation tests were performed at the same time. Of this group 11 were shown to be excreting ova at the time. A "pinch" biopsy through the sigmoidoscope of localized lesions of the bowel mucosa was performed, and in seven cases ova were found in the material removed. However, it should be pointed out that in the survey made some months later a further 18 out of these 38 men were proved to be excreting ova. At the time of the sigmoidoscopic examination it had been suggested that further stool examinations would probably reveal more cases. No pathognomonic sigmoidoscopic bowel picture was found. However, the finding of punctate submucosal hæmorrhagic areas was significant, and infiltrative granular, greyish, elevated lesions about one millimetre in diameter yielded ova.

Later sigmoidoscopic examination was performed in another six cases. These men were chosen on account of the large number of ova being excreted. In two of these cases the bowel wall appeared normal. In three cases small greyish nodules, of pin-head size, usually with slight surrounding congestion, were seen. The remaining patient was more heavily infested; the mucosa was œdematous, and along the whole of the bowel one could see small pearly submucosal swellings about one or two millimetres in diameter.

As a routine diagnostic procedure sigmoidoscopy is not warranted in the early stages. It should have its uses in the later stages of bowel damage when ova are scarce.

Eosinophilia.

Eosinophilia of a fairly high order generally occurs in cases of schistosomiasis. The finding in this series of cases was of a definite increase in the number of eosinophile cells in the early months after infestation, with a fall in the later months in spite of the presence of living worms and the passage of ova in the stools. This finding tended to support the view that the eosinophile cell rate was of little use as a clue to cure, and from the point of view of diagnosis was helpful only in the early stages.

So many other parasitic infestations occurring in the same localities as schistosomiasis may give rise to eosinophilia, that other diagnostic methods must be used. However, it would appear that in a large group of men suspected of recent infestation with schistosoma, the eosinophile cell rate would give a rough clue to the possibility of infestation.

In all the cases in this series, in only four was a consistent eosinophile cell count of under 10% obtained in the early months. In the rest the count was over 10%, though in six cases the first count was normal, but on repetition of the test two weeks later the eosinophile cell count was found to be raised.

Table I shows the eosinophile cell rate in 126 cases. The first blood count was performed some three and a half months after infestation; six to eight months later, all these men were proved to be still excreting mature viable schistosoma ova in the stools. It can be seen that the eosinophile cell count at this latter date had fallen considerably.

TABLE I.

Change in Eosinophile Cell Percentage over a Period of Six and a Half Months.

Eosinophile Cell Percentage.	Number of Cases.	
	Three to Four Months After Infestation.	Ten to Twelve Months After Infestation.
0 to 5	1	18
6 to 10	3	26
11 to 15	4	28
16 to 20	13	20
21 to 25	9	15
26 to 30	16	8
31 to 35	10	5
36 to 40	15	4
41 to 45	8	1
46 to 50	21	1
51 to 55	11	—
56 to 60	6	—
61 to 65	2	—
Over 65	7	—

The average total eosinophile cell count three and a half months after infestation was 5,100 per cubic millimetre, while ten to twelve months after infestation it had dropped to 1,700 per cubic millimetre in the cases mentioned in Table I.

It was thought that a change might occur in the eosinophile cells while the patient was under treatment with tartar emetic. The course lasted for three and a half to six weeks. Therefore a comparison was made between the count at the start of treatment and the count the day after the last injection. The total dose given in these cases was two grammes intravenously. Table II shows the changes in the eosinophile cell count in a series of 40 patients undergoing this treatment.

It can be seen that the general tendency was towards a slight fall in the absolute and relative eosinophile cell values. In one case the eosinophile cell percentage, which had previously been 29, became 60. This was the only case in which a considerable rise occurred, and was possibly associated with the effect of treatment, though why it occurred in only one case is difficult of explanation.

There appears to be little point in making frequent white cell counts during the course of treatment, as the information gained gives negligible help with regard to the progress of the cure. In view of the large number of injections given during the treatment, the fewer finger pricks the patients undergo the better. It is easy for these men to develop a schistosomiasis neurosis; this actually occurred early in the campaign. In chronic diseases with prolonged and sometimes painful and unpleasant treat-

TABLE II.
Eosinophile Cell Count Before and After Treatment in 40 Cases.

Time of Test.	Eosinophile Cell Percentage (Average).	Eosinophile Cell Total (Average) per Cubic Millimetre.	Maximum Eosinophile Cell Count per Cubic Millimetre.	Minimum Eosinophile Cell Count per Cubic Millimetre.	Ova.
Before treatment	20	2,070	5,640	400	+
After treatment	16	1,480	6,840	256	−

ment, the mental outlook of the men was seen to be all-important.

It is difficult to assess how long the eosinophile cell count may take to return to normal after cure, the main difficulty being the criterion of cure. Antimony appears to suppress the egg-laying capabilities of the worms, and parasites not killed by the drug may not produce ova in the stools for some months or even years afterwards.

A series of 14 patients who had been excreting ova in the stools were treated with tartar emetic (two grammes). These men were examined carefully three or four months later, especially for evidence of ova in the fæces. In no case were ova found, though as many as seven stool tests were performed, including hatching tests for miracidia. The eosinophile cell counts prior to treatment and again some three or four months later when no ova were found in the stools, are compared in Table III. There was a pronounced fall in the number of eosinophile cells to virtually a normal count in most cases.

It would be as well at this stage to mention the possible effect of other worm infestations in the causation of eosinophilia. A survey of the personnel ten to twelve months after exposure to infestation with schistosoma, showing the number of men infested with the various parasites and the accompanying eosinophile cell rates, is given in Table IV.

Probably some mild infestations of hookworm and ascaris may have been missed, particularly in those who suffered from schistosomiasis. Many of the last mentioned cases were proved on one stool test, whereas in the "negative" cases at least five stool tests were always carried out.

Table V shows the eosinophile cell count in 337 men in whom no ova of any parasites could be found. The eosinophile cell counts in Table V were found at the last examination ten to twelve months after exposure to infestation when the men had arrived back in Australia. The great bulk of these men had normal eosinophile cell counts. Seventeen men had eosinophilia of over 10%, for which no adequate reason could be found.

Lowe[10] (1944) mentions that unexplained eosinophilia may occur in people resident in the tropics, and presumably these men fall into this group. They had no symptoms, and fairly exhaustive stool tests gave negative results for any evidence of intestinal parasites. There were no skin rashes. The Fairley test in these cases produced negative results.

Complement Fixation Test.

The possibility of using a cercarial antigen for the complement fixation test in the diagnosis of human schistosomiasis was first put forward by Fairley (1919), and this test is often referred to in this connexion as the Fairley test. He found that an antigen made from cercariæ in infected snails was specific and gave positive results only in cases of infestation with schistosomes. Fairley[22] reported in 1926 that cercariæ of *Schistosoma spindale* acted satisfactorily as an antigen in the fixation test to detect *Schistosoma hæmatobium*, *Schistosoma indicum* and *Schistosoma spindale* varieties. This antigen was used by Fairley and Williams[23] for the complement fixation test and for an intradermal test. In 1930 Fairley[24] *et alii* published a complete investigation of the complement fixation reaction in goats infested with *Schistosoma spindale*, cercarial extracts of *Schistosoma spindale* being used as antigen. They found that adult worms were unsatisfactory as antigens. They mentioned that the antigen was suitable for detecting all three varieties of schistosoma which infest man, and also that it could be used to detect *Schistosoma bovis*, *Schistosoma indicum* and *Schistosoma spindale*.

Recently Pifano and Mayer[25] have investigated the Fairley test, using extracts of the hepatopancreas of *Planorbis glabratus* infested with *Schistosoma mansoni*. They found that 97·3% of persons passing ova of *Schistosoma mansoni* in the stools gave a positive reaction to the Fairley test, and that the reaction was obtained in 40% of patients clinically suspected and having a history of exposure to infestation, but without ova in the fæces.

The Fairley test is a quantitative reaction, and accurate standardization of complement is carried out and the minimum hæmolytic dose is obtained. The amount of complement fixed in the test was accurately obtained and given as so many minimum hæmolytic doses of complement. The antigen used in the complement fixation test performed on the men in this investigation was made from the livers of the snail *Planorbis exustus* infested with *Schistosoma spindale*. This antigen was originally prepared in 1928, and had been kept refrigerated since this date. Complement fixation tests were carried out by F. E. Williams at the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne. The techniques used will be fully described in a separate paper.[26]

A study of the results obtained in testing 560 men of the construction squadron is here presented. It is possible to compare the results of the Fairley test with the stool examinations and blood counts in every one of these cases. In this series the Fairley test was performed between ten and twelve months after infestation except in six cases in which earlier tests were also carried out. The results of complement fixation tests and stool findings are shown in Table VI. Of this group, 169 (30%) gave a positive reaction to the Fairley test, a fixation of three or more minimum hæmolytic doses of complement being regarded as a positive result. An analysis of these

TABLE III.
Eosinophile Cell Count Before Treatment and Three and a Half Months After Treatment in 14 Cases.

Time of Test.	Average Eosinophile Cell Percentage.	Average Total Leucocytes per Cubic Millimetre.	Average Total Eosinophile Cells per Cubic Millimetre.	Maximum Total Eosinophile Cells per Cubic Millimetre.	Ova.
Before treatment	9	10,000	1,900	6,290	+
Three or four months after treatment ..	6	8,800	528	1,243	−

positive results is considered under the following headings: (*a*) positive stool findings and (*b*) negative stool findings.

Positive Stool Findings.

Of the 169 men giving a positive reaction to the Fairley test, 139 had been proved to be passing schistosoma ova in the stools. One hundred and twenty-one patients were excreting ova at the time of the test, 13 had been excreting ova three months previously but not at the time of the test, and five men had been excreting ova five months previously. One hundred and forty-four subjects were shown to be excreting ova at some time or another. Only five patients in whose stools ova had been found, failed to yield the Fairley reaction. This figure agrees closely with that found by Pifano and Mayer. There appeared to be nothing unusual about these five cases, and no reason could be adduced for the failure of the test. Four of these subjects had had early unsuccessful "Fouadin" therapy and one was untreated; they were all excreting ova at the time of the complement fixation test.

TABLE IV.
Parasitic Infestation of Unit on Return to Australia.

Ova in Stools.	Number of Cases.	Eosinophile Cell Percentage. (Average.)	Eosinophile Cell Total per Cubic Millimetre. (Average.)
Hookworm	42	10	1,080
Ascaris lumbricoides ..	25	9	700
Hookworm and ascaris ..	2	10	1,000
Schistosoma and ascaris	4	12	1,030
Schistosoma and hookworm	3	12	1,320
Schistosoma japonicum ..	118	16	1,600

It is not known how long the response to the complement fixation test may take to return to normal. Fairley suggests that after cure there is a gradual fall in the fixation of complement, possibly many months being required before the response to the test is negative. Two of these men had had a complement fixation test performed five months previously; the original amounts of complement fixed were 20 minimum hæmolytic doses and 40 minimum hæmolytic doses respectively, and in the second test the amounts were eight and five respectively. Thirteen men had had a full course of treatment with tartar emetic (two grammes), after ova had been found in the stools. Some three and a half months later the stools of all these men failed to yield ova, and the response to the Fairley test was still positive. The average minimum hæmolytic dose obtained was nine, the maximum being twenty and the minimum three.

Negative Stool Findings.

There were 30 cases in which the Fairley test produced a positive reaction, but in which no ova had been found in the stools at any time. This group may be divided into two classes: (i) patients who had been given "Fouadin" treatment three and a half months after exposure to infestation, on account of suggestive symptomatology and an eosinophile cell count of over 10%; (ii) patients who had never had any treatment and were regarded as not affected till the Fairley test had been performed.

TABLE V.
Eosinophile Cell Rate in 337 Uninfested Personnel.

Eosinophile Cell Percentage.	Number of Cases.	Stool Findings.	Fairley Reaction.
0 to 5	291	—	—
6 to 10	29	—	—
11 to 15	9	—	—
16 to 20	5	—	—
Over 20	3	—	—

Twenty-two men fall into the first group. They were treated with intramuscular injections of "Fouadin" (40 millilitres total dose). At the time of treatment the average eosinophile cell count was 37%, and in no case was it below 20%. Most of these men had symptoms suggestive of the initial fever of schistosomiasis. When the Fairley test was performed approximately seven and a half months after treatment, their stools were free from ova of schistosomiasis, though four had hookworm infestation and two had ascaris infestation. They were symptom-free at this time, and their average eosinophile cell count was 9%, the minimum being 3% and the maximum 25%. The amount of complement fixed varied from three to 25 minimum hæmolytic doses. Every effort was made to find ova in the stools, as many as seven stool tests being performed, including hatching tests for miracidia. It would seem fair to assume that these 22 men had suffered from schistosomiasis, and had possibly been cured as a result of the treatment. The relapse rate of the patients treated with "Fouadin" is discussed later. However, in view of the well-known difficulty of finding ova in the stools of subjects harbouring only a few living worms, all these men were given a routine course of tartar emetic, two grammes intravenously being the total dose.

TABLE VI.
Results of Complement Fixation Tests and Stool Examinations of 560 Subjects.

Number of Specimens of Serum.	Minimum Hæmolytic Doses of Complement.	Complement Fixation.		Stools.	
		Present.	Absent.	Schistosoma Ova Found.	No Schistosoma Ova Found.
391	0	0	391	5	386
22	3	22	—	12	10
25	4	25	—	18	7
10	5	10	—	10	—
11	6	11	—	6	5
11	7	11	—	8	3
9	8	9	—	9	—
9	9	9	—	9	—
11	10	11	—	10	1
9	12	9	—	8	1
12	15	12	—	11	1
6	18	6	—	6	—
19	20	19	—	18	1
2	25	2	—	1	1
5	30	5	—	5	—
1	35	1	—	1	—
7	40	7	—	7	—
560		169 (30·2%)	391 (69·8%)	144 (25·7%)	416 (74·3%)

Eight men were found to react to the Fairley test, though they had previously not been regarded as suffering from schistosomiasis, and no ova were ever found in their stools. They had all been exposed to infestation. This group differs from the preceding group in that none of the subjects showed any initial febrile symptoms, and the original eosinophile cell count was low; the average was 9%, and seven and a half months later at the time of performance of the complement fixation test it was 3%, the total white cell count being normal. The amount of complement fixed varied from three to seven minimum hæmolytic doses.

Discussion.

The following reasons can be adduced to account for the positive result to the complement fixation test without any other evidence of infestation: (i) an initial invasion of the body by cercariæ, which failed to develop into mature worms but were sufficient to provoke a humoral response on the part of the tissues; (ii) development or survival of only one sex of the worm in the body; this could account for the lack of initial response on the part of the host, which is most pronounced at the onset of egg-laying; (iii) death of the mature worms unaided by any therapy; probably not all worms are endowed with the grand longevity allowed to a few.

From the previously given facts, it can be seen that the Fairley test has a definite value. It is a delicate test,

and by its use a number of cases will be diagnosed which otherwise would have been missed. This would apply particularly in the later stages of the disease, when ova become increasingly difficult to find. A positive response to the Fairley test in association with a history of exposure to infestation should warrant treatment, in spite of negative results to stool examination. By all standards the complement fixation test must be regarded as remarkably accurate. The response to the Fairley test was negative in only 3·5% of cases in which stool examination yielded positive results. "False positives" must be exceedingly rare. At the time these tests were carried out, 80 control sera were tested from adults with no history of exposure to schistosoma infestations; 40 of these were from normal adults and 40 were from adults who reacted to the Wassermann test. All 80 sera failed to react to the Fairley test.

TABLE VII.

Number of Cases.	Total Eosinophile Cells per Cubic Millimetre.	Complement Fixed. (Minimum Hæmolytic Doses.)
25	0 to 500	9
31	500 to 1,000	8
25	1,000 to 1,500	14
16	1,500 to 2,000	13
13	2,000 to 2,500	16
6	2,500 to 3,000	12
6	3,000 to 3,500	16
4	3,500 to 4,000	9
6	Over 4,000	19

The test should be useful in survey work. The complement fixation test was completed in much less working time in this series than were the stool examinations, which were laborious to a degree.

The antigen used in this test was remarkable for its relative antiquity. It did not appear to have lost any of its antigenic properties through storage for eighteen years. *Schistosomophora hydrobiopsis*, the intermediate host of *Schistosoma japonicum* in the Philippines, is a very small snail; snails infested with other forms of schistosoma are larger, and therefore more satisfactory for the production of antigen.

The relation of the eosinophile cell count to the quantity of complement fixed has been studied, in a series of 132 men in whose stools ova were found, and is shown in Table VII.

The cases have been divided into groups according to the total eosinophile cell count at the time of performance of the complement fixation test. The average amount of complement fixed in each group is shown. There is little relation between the cell count and the serological response as indicated by the quantity of complement fixed. Neither of these factors seemed to have any bearing on the finding of ova in the stools, though admittedly this was mainly an impression, as no accurate work was done in this regard.

The amount of complement fixed in the cases in which ova were actually being excreted at the period of the performance of the test, was variable. The maximum amount of complement fixed was 40 minimum hæmolytic doses, and the minimum amount regarded as a positive result was three minimum hæmolytic doses. It is hoped later to publish a study of the changes in the quantity of complement fixed at succeeding examinations of these men. In this way it should be possible to estimate the length of time for the response to the test to become negative.

Diagnosis.

The diagnosis depends almost entirely on laboratory investigation once a history of exposure to infestation has been obtained.

The clinical course of the disease falls into three stages, and the problems of the diagnosis vary considerably at different times. There are, firstly, the stage of initial febrile illness, secondly, the latent stage, and thirdly, the stage of visceral damage.

Any febrile illness associated with eosinophilia occurring in an endemic area should suggest the possibility of schistosomiasis. Positive results to the complement fixation test will reveal the presence of schistosoma infestation before ova are found in the fæces, and careful and repeated stool examination will enable a definite diagnosis to be made once ova are present in sufficient density to be demonstrable microscopically.

The latent stage provides difficulty, and it is only in a series such as that under discussion, in which the suspicion of infestation is aroused by a previous history of exposure, that steps will be taken to diagnose the condition. Stool examinations and complement fixation tests should be made.

In an endemic area the late stage of visceral damage should offer no difficulties, while the history of previous travel or residence in endemic countries may suggest the possibility of schistosomiasis. Ova are often hard to find at this stage, and the complement fixation test and sigmoidoscopy may prove essential procedures in diagnosis. Blood examination, the Fairley test and sigmoidoscopic examination have all been discussed. It remains to mention the technique of stool examination used in the present series.

Technique of Stool Examination.

Except in heavy infestations, ova are difficult to find, and repeated examinations may have to be undertaken. The procedure used in this investigation was modelled on lines recommended by the United States Commission on Schistosomiasis. It is as follows:

1. Approximately five grammes of stool (size of half a thumb) were thoroughly mixed and suspended by stirring in about 200 millilitres of tap water containing 0·5% of glycerin. It was helpful to add only a few drops of water at first, making the fæces into a paste and gradually adding the water, stirring all the while.
2. This suspension was poured through six layers of gauze into a conical urinalysis glass of 250 millilitres' capacity, and the material was allowed to form a sediment for three-quarters of an hour, when the supernatant fluid was decanted. More glycerinated water was added and this sedimentation was repeated twice, the periods allowed being half an hour each.
3. Finally, samples of sediment were drawn up in a Pasteur pipette, deposited on a clean slide, spread over the whole area of the slide, and examined microscopically.

Usually only two or three eggs were found on one slide prepared in this way; but occasionally the figure varied from one to fifty eggs on a slide. Great patience was necessary for this work, and an average of ten to fifteen minutes was spent on each slide. During the final survey five specimens of stool were examined from each man, specimens usually being obtained on five successive days.

In a series of 105 cases, 73 specimens gave positive results on the first examination, 14 on the second examination, 14 on the third, two on the fourth, and two on the fifth. A positive result was recorded only on the finding of mature undegenerated ova. In some cases, as has been mentioned previously, hatching of miracidia was attempted, the final sediment being used and tap water being added.

Faust and Meleney give an excellent description of the appearance of the ova. However, the rudimentary spine was not noted in the present series. This agrees with the finding of Johnson and Berry.[15]

Treatment.

Originally "Fouadin" had been used for the patients, as it had been thought that this would give the best results, as well as being the least toxic drug available. "Fouadin" is a synthetic trivalent antimony compound (antimony pyrocatechin disulphonate of sodium). It is a white powder containing 13·5% of antimony. It was used in solution containing 8·5 milligrammes of antimony in one millilitre. Nine intramuscular injections were given on alternate days, the total dose being 40 millilitres. This represented treatment with 340 milligrammes of

antimony. Little toxic reaction was noted, and the men were treated as out-patients as far as possible. Out of this series 177 were treated with "Fouadin", and of these 103 relapsed, ova being subsequently detected in the stools. As the 177 were treated purely on the presence of symptoms and eosinophilia, it is possible that some were not actually suffering from schistosomiasis. Thus the relapse rate of 58% is a conservative figure.

In view of the poor results with "Fouadin", antimony potassium tartrate (tartar emetic) was then used intravenously to treat any new patients and any who had relapsed. McDonagh[28] first mentioned the possibility of using antimony to treat schistosomiasis, though Christopherson[29] had independently started using it in May, 1917, and it was the latter's work that popularized the use of the drug for this disease.

The following routine was adopted for giving the tartar emetic. The drug was made up freshly each day in a 1% solution, the diluent being sterile glass-distilled water. The drug was then sterilized by being boiled for five minutes, and on cooling was ready for injection. The initial dose was three millilitres of the 1% solution, followed by doses of five millilitres, eight millilitres and finally the maximum dose of 10 millilitres (0·1 gramme of tartar emetic). The first 30 patients were treated by intravenous injections given on alternate days. However, it was then decided to shorten the period of treatment by giving the injections every day, with a rest on the seventh day, the same dosage as previously being used. In this way a total dose of two grammes of tartar emetic was given in about three and a half weeks, 22 injections being given in all. One hundred and thirty-nine men were treated with tartar emetic (two grammes), and in no case had treatment to be suspended on account of toxic effects of the drug. It was found that the daily injections were just as satisfactory as injections on alternate days. In fact, strangely, the men seemed to be less affected in some ways by the rapid treatment.

Unpleasant effects of the drug could be divided into immediate and delayed effects. The immediate effects were coughing, nausea and occasionally vomiting. Fainting attacks, giddiness, diarrhœa and abdominal colic were not encountered in this series. Delayed effects encountered were mainly rheumatic pains in the joints and muscles, developing during the evening after the injection. They generally occurred after the seventh or eighth injection and were most severe after about the thirteenth or fourteenth injection, often easing off after this. In some cases the pains were fairly severe. The joints affected were amazingly varied; sometimes it was one shoulder, or an elbow or the hips or the spine. Occasionally all joints were affected. These rheumatic pains appeared to be less severe when the patients were injected daily. These men had a rest on the seventh day, and the comment invariably made was that the joint pains were much worse after the injection following the rest.

The patients were treated as far as possible as out-patients, being put to bed only when joint pains became severe. They were told to lie down for one hour after injection. By treating the men as moderately healthy human beings, and by careful reassurance as to the ultimate prognosis, a normal and hopeful outlook on their disease was maintained. This was important, as previously they had been regarded by other units as outcasts and pariahs and likely to have a short and rather tragic life.

Follow-up is most important in this disease. It is intended to check the condition of these men in six months, and in certain cases more frequently. It is hoped to be able to publish at a later date the results found at the subsequent examinations of these men, and to assess then the results of tartar emetic therapy.

Summary.

1. A report is given of an outbreak of Asiatic schistosomiasis in a Royal Australian Air Force unit, in which 226 men received treatment.

2. The geographic distribution of the disease is discussed, with reference to the cases of schistosomiasis that have occurred in Australia in the past.

3. A description is given of the initial febrile illness and of the course of the disease over twelve months from the time of the infestation. The occurrence of symptomless infestations is recorded.

4. Changes in the white cell count are reported.

5. The results of the Fairley complement fixation test are discussed. The accuracy of the test is stressed. A comparison is made between the eosinophile cell rate and the results of the complement fixation test.

6. A routine method of examination of the stools for ova of *Schistosoma japonicum* is described.

7. The effects of treatment are reported, with the percentages of cure obtained by treatment with "Fouadin".

8. A shortened course of tartar emetic treatment is described, in which two grammes may be given in three and a half weeks.

Acknowledgement.

We wish to extend thanks to the following: Air Commodore E. A. Daley, Director-General of Medical Services, Royal Australian Air Force, for permission to publish this article; Group Captain A. H. Baldwin and Brigadier N. H. Fairley for advice and criticism given during the investigations; Sergeant H. Turner and Corporal H. Blackmore for assistance with the laboratory work; Miss M. Rolleston, Librarian of the New South Wales Branch of the British Medical Association; Squadron Leader A. Uglow, who was associated with the early part of the investigations; Miss F. E. Williams, who performed all the complement fixation tests at the Walter and Eliza Hall Institute, Melbourne. Tribute must also be paid to the men of Number 3 Airfield Construction Squadron, Royal Australian Air Force, who, despite the handicap of this disease amongst their numbers, were awarded a special plaque by General MacArthur for their fine work in the Philippines.

References.

(1) W. H. Nelson: "Notes on Three Cases of Bilharzia Hæmatobia", *The Australasian Medical Gazette*, November 9, 1912, page 482.

(2) T. Cherry: "Bilharziosis. Part I. Bilharziosis and the Danger of the Disease Becoming Endemic in Australia", Commonwealth of Australia, Department of Defence Publication, 1917, page 1.

(3) D. M. McWhae and T. R. Jagger: "Bilharziosis in Western Australia", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1921, page 217.

(4) H. K. Pavy: "Intravenous Injections of Antimony Tartrate in the Treatment of Bilharziosis", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1921, page 155.

(5) W. Summons and H. Irving: "Observations on the Treatment of Egyptian Bilharziosis by Tartar Emetic", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1921, page 83.

(6) K. D. Fairley and N. H. Fairley: "Bilharzia in Immigrants from Palestine", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1929, page 597.

(7) E. P. Holland and E. A. Woodward: "A Case of Bilharziosis Endemic in Australia", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1924, page 606.

(8) J. Milton: "Schistosomiasis in Australia", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1923, page 166.

(9) E. C. Faust and H. E. Meleney: "Studies on Schistosomiasis Japonica", *The American Journal of Hygiene*, Monographic Series Number 3, March, 1924.

(10) W. H. Edgar: "Tangtze Fever", *The Journal of State Medicine*, Volume XXI, September, 1913, page 542.

(11) P. W. Bassett-Smith: "Blood Determination in a Case of Katayama's Disease", *British Medical Journal*, Volume II, November 2, 1912, page 1208.

(12) F. B. Lawton: "The Early Symptoms Following Infection by Schistosomum Mansoni", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1917, page 247.

(13) J. T. Spiridion: "Schistosomiasis Japonica, An Account of an Outbreak", *The Journal of Tropical Medicine and Hygiene*, Volume XXXIX, July 15, 1936, page 161.

(14) A. R. Hunt: "Schistosomiasis in Naval Personnel: Report of 16 Cases", *United States Naval Medical Bulletin*, Volume XLV, March, 1945, page 407.

(15) A. S. Johnson and M. G. Berry: "Asiatic Schistosomiasis: Clinical Features, Sigmoidoscopic Picture and Treatment of Early Infections", *War Medicine*, Volume VIII, September, 1945, page 156.

(16) T. P. Almy and J. G. M. Harper: "Banti's Syndrome Apparently Due to Infection with Schistosoma Mansoni", *The Journal of the American Medical Association*, Volume CXXVI, November 11, 1944, page 703.

(17) N. H. Fairley: "Vesical Schistosomiasis Complicated by Carcinoma", *British Medical Journal*, November 28, 1931, page 983.
(18) Z. T. Bescovitz, R. Rodriguez-Molina, D. W. Hargrave, J. D. Dickie and C. E. Green: "Studies on Human Schistosoma Mansoni Infections: 1. Proctoscopic Picture of Asymptomatic Schistosomiasis Mansoni Infections", *The Journal of the American Medical Association*, Volume CXXV, August 5, 1944, page 961.
(19) T. E. Lowe: "Eosinophilia in Tropical Disease: Experiences at an Australian General Hospital", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1944, page 453.
(20) N. H. Fairley: "A Preliminary Report on an Investigation of the Immunity Reactions in Egyptian Bilharziosis", *The Journal of the Royal Army Medical Corps*, Volume XXXII, April, 1919, page 244.
(21) N. H. Fairley: "The Discovery of a Specific Complement Fixation Test for Bilharziosis and its Practical Application to Clinical Medicine", *The Journal of the Royal Army Medical Corps*, Volume XXXII, June, 1919, page 449.
(22) N. H. Fairley: "The Serological Diagnosis of Schistosoma Spindalis. Cercarial Antigen", *Archiv für Schiffs- und Tropenhygiene*, Volume XXX, 1926, page 372.
(23) N. H. Fairley and F. E. Williams: "A Preliminary Report on an Intradermal Reaction in Schistosomiasis", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1927, page 811.
(24) N. H. Fairley, F. P. Mackie and P. Jasudasan: "Studies in Schistosoma Spindale", *Indian Medical Research Memoirs*, Supplementary series to *The Indian Journal of Medical Research*, Memoir Number 17, September, 1930.
(25) C. F. Pifano and M. Mayer: "Sobse el comportamiento de la reaccion de Fairley en los Estadios Clinicos de la Schistosomiasis mansoni", *Revista sanidad y asistencia social*, Volume VII, June, 1942, page 379; abstracted in *Tropical Diseases Bulletin*, Volume XLI, July, 1944, page 589.
(26) F. E. Williams: "The Complement Fixation Reaction in Asiatic Schistosomiasis Employing Cercarial Antigen (S. Spindale)", in preparation.
(27) R. Campbell-Begg: "Bilharzia Disease: Some Prevalent Misconceptions", *South African Medical Journal*, Volume XVIII, July 22, 1944, page 239.
(28) J. E. R. McDonagh: "Antimony in Bilharziosis", *The Lancet*, Volume II, September 14, 1918, page 371.
(29) J. B. Christopherson: "The Successful Use of Antimony in Bilharziosis, Administered as Intravenous Injections of Antimonium Tartratum", *The Lancet*, Volume II, September 7, 1918, page 325.
(30) N. H. Fairley: "Observations on the Clinical Appearances of Bilharziasis in Australian Troops, and the Significance of the Symptoms Noted", *The Quarterly Journal of Medicine*, Volume XII, 1919, page 391.
(31) N. H. Fairley: "A Comparative Study of Experimental Bilharziasis in Monkeys Contrasted with the Hitherto Described Lesions in Man", *The Journal of Pathology and Bacteriology*, Volume XXIII, 1920, page 289.

LÉON DAUDET: SOME EXTRACTS FROM HIS MEMOIRS DEALING WITH FRENCH MEDICINE IN THE EIGHTIES AND NINETIES.

By G. H. HOGG, M.D.,
Launceston.

LÉON DAUDET was born in 1867 the son of Alphonse Daudet, the famous French author, whose lucidity and charm of style as well as of personality won from Zola the name of *le charmeur*.

There was a close affection and association between father and son, so that from boyhood Léon had the good fortune to be brought into touch with all the leaders of Parisian intellectual society, literary, scientific and medical. Léon commenced the study of medicine under the distinguished auspices of his father's friends Charcot, Potain and Péan. His great friend and fellow student was Jean Charcot who was to become famous as sailor and explorer.

As student, externe and interne, he was in the closest touch with the leading hospitals, the Charité, the Necker, the Hôtel-Dieu, the Salpêtrière and others. Of these and of some of the men who had made the Paris faculty so famous he has left in his writings recollections which may prove interesting to some of us who were students or young graduates in the eighties and nineties of last century, and perhaps even to men of the present day; for as Daudet says, the prestige which French medicine enjoyed at that time was most marked and attracted visitors from all countries.

Although Léon did not possess the literary charm of his father, he was a versatile writer, a bitter controversialist and politician, a critic, journalist, and a writer of memoirs by which he perhaps will be best remembered.

Charcot he describes as a stout man, stocky in build with a bull's neck (he had a look of Napoleon I which he rather studied), clean shaved, with a commanding voice, emphatic and often ironical, and with eyes of extraordinary brilliance. Charcot's erudition was immense, he knew the poets through and through, notably Æschylus, Dante, Shakespeare, the philosophers, specially favouring the Greeks. European painting was an open book to him; he admired music, especially Beethoven, but detested Wagner.

Without gentleness or sympathy towards humans, Charcot had a profound sympathy for animals, spoilt dogs like children, and forbade anyone speaking to him about shooting or hunting. He read extensively in English, German, Spanish and Italian; as regards foreigners he had a marked preference for English and Russians, but Germans bored him. He disliked contradiction and criticism, however slight, and became angry and illogical if anyone dared to differ from him or to contradict him regarding his doctrines touching the nervous system, aphasia, *et cetera*. Stupidity exasperated him and his need for domination resulted in his being surrounded by mediocrities, so that he came to be disliked by many young doctors.

An intense worker, Charcot passed many of his nights in working over problems of pathological anatomy or in constructing diagrams or plans explaining different forms of aphasia. Never satisfied with his own work, he used to return at regular intervals to the same problems, seeking to elucidate and to clarify nature in its primordial elements. He was generous and even prodigal, adored his two children, a son and daughter who returned him an equal affection; he kept open house for his friends amongst whom were the great writers, artists and scientists of France.

He was very fond of young people, who used to fill his house with songs, cries and laughter. If, as Daudet says, it was the paradise of youth, it was a hell of nervous suffering. What must these German, Russian, American, Polish, English millionaires have thought, while they waited, accompanied often by their doctors and nurses, of all those noisy youngsters as they rushed through the various rooms.

Charcot's clinic at the Saltpêtrière was then the most famous in Europe, drawing visitors from all over the world. His chief assistants were Marie and Ballet, sensible kindly men according to Daudet, but lacking in genius and originality, good pupils of Charcot, but nothing more. Never imagining that the cerebral peduncle, the kidney, the liver could be otherwise than what Charcot had described or that these organs would dare to disobey their master, when in due course they became professors they continued Charcot's methods.

Babinski and Sollier were the two keenest observers. Gilles de la Tourette, Brissaud, Marie, Ballet, attentive disciples, took part in this the most original and instructive of the world's clinics.

Daudet describes the clinic in dramatic form:

> Charcot enters, bows to his audience, gives two fingers to his *chef de clinique*, one to his interne. His *chef de clinique* reports anything of importance which may have happened and Charcot gives any necessary advice. A patient is then brought in; if Charcot sees him for the first time he always questions him, and here his skill is revealed, for he seizes immediately on the essential point, sweeping aside any secondary matters which might confuse another physician. Turning to the patient, he may say, do this or that, stretch your leg, pronounce this word and so on. As he proceeds he may tell his audience of a similar case, quote a verse of Racine, of Molière, of his beloved Shakespeare or of Dante, recall a painting of Hals or Velasquez, affording a wonderful display of medical knowledge and its association with literature and art. But one can see how the disease itself interests him more than the sufferer. The search after the great secrets of life and of nervous disease made him neglect such trifling

matters as treatment; in therapeutics he took little interest regarding the disorders of the human machine much as an astronomer does the movements of the stars. The scepticism of Montaigne appealed to him, he often showed that he was hostile to Catholicism, yet sympathetic to the mysticism of Buddha, why I know not, nor could he himself tell.

In 1890 after a Christmas party in his home on the Boulevard St. Germain, in which Charcot had taken the greatest pleasure because of the gaiety and fun of his younger guests, he was seized with a heart attack as he retired to his room. He gave a groan, placed a hand to his breast and sank into an armchair. Daudet ran for Potain who lived near by; it was 2 o'clock in the morning and Potain was in his nightgown. He slipped on his trousers, coat and fur cloak and they went down the steps of his house into the freezing night—in a few words Léon told him what had happened. On entering the room of his distinguished *confrère*, he signed to be left alone with Charcot. A quarter of an hour later Potain came out with a short prescription in his hand—"It is nothing, nothing at all" he said, "a simple gastric disturbance."

I noticed, however, his haste in reassuring us and a certain mannerism of his of plunging his hands into his pockets and opening his eyes widely which indicated in him a grave preoccupation. As I accompanied Potain to his house, he said to me in a low voice, hardly to be heard, he thought it was *"angina pectoris"*. I had to reassure him. Then, after a pause, "he was not deceived".

We were now on the landing, I holding a candle and the professor putting the key in the lock. I was terribly shocked at the sentence of death being pronounced by the infallible authority on heart disease. I murmured as I shivered with the cold and the fright: "How long, sir?" With the infinite kindness which characterized him, he put his hand on my shoulder: "Two years, two years and a half at the longest."

Next day, Charcot, completely recovered, smiled on his visitors, making fun of his fright of the previous night. I have often wondered if Potain was successful in deceiving him or whether Charcot pretended to be deceived. What is certain is that two years and a half later the prognosis was confirmed.

Professor Potain is described by Daudet as the living antithesis of Charcot. He loved his fellow men and saw in his art a way to help them, his goodness spread from his family, his friends, to his patients, his pupils, to everybody. All the processes of his intellect were diverted to the relief of disease, often most desperate, for which the cry went out to him from all classes, from every part of France and of Europe. A savant, an investigator, an experimenter of the first rank, he had unfortunately no time left him for this work by the appeals, the prayers, the tears of a multitude of sufferers who came to him as to the last hope. His morning at his hospital, his visits in the afternoon, his consultations at his house opposite Charcot's in the Boulevard St. Germain, his evenings taken up to 2 a.m. by his notes and observations—he was never at rest.

Certainly he earned a big income, but he gave away more, and that with a tact and kindness which increased tenfold the sum of his charities. When a shabby looking convalescent patient was about to leave his wards he would slip him a 500 franc note; if it happened to be a workman's wife or mother, a still larger sum. This done he would hurry away to escape the patient's thanks. His carriage at the hospital was followed often by some sickly pauper, by some ragged housewife to whom he handed out a louis from his vest pocket which was always well stocked. "My friend Vaquer and I (Vaquer was his interne while I was his externe) used to estimate that every year he must in this way have given away a small fortune."

His attention to his patients was of the kindliest. Daudet tells for instance of a man suffering from an enormous aneurysm of the aorta which had slowly eroded through the thoracic wall and was beating under the skin. Each day Potain devoted some time to him, returning in the afternoon evidently piqued at his impotence to aid. One afternoon, judging that the awful moment had come, he asked for cotton wool and bandages and with great care he bandaged the poor fellow. Hardly had he finished than the dressing became red as a bull-fighter's scarf, and the poor fellow resting his head in Potain's arms peacefully passed away.

As a clinician he was very firm and insistent on method. Called with Charcot to the bedside of Daudet *père*, Léon tells how Potain commenced auscultation without paying any attention to Charcot saying, "I have done all that". Another time five or six leading physicians were consulting on a case of a man suffering from a complicated sciatica. Not one of them had examined him, they were all discussing treatment. "Well gentlemen", Potain said, "I want to hear his history and examine the patient." Whenever he had finished examination he buried himself in long meditation which "we refrained from interrupting".

Potain's hospital course had a very large following, for there alone could one learn the pathology of the heart and circulatory system, the premonitory signs of interstitial nephritis and tuberculosis. No wonder that the best men in the faculty solicited the honour of taking part in his clinic. To see him carry on an examination was a revelation. No murmur, no fremitus, no *bruit de galop*, however slight, escaped him. His hearing rivalled that of the Indians of Fenimore Cooper. He analysed superimposed sounds. He could distinguish the imperceptible hardening of a valve.

Potain had an appreciation of the whole case; with an incomparable sagacity he foresaw all complications and so combined his remedies. He was one of those rare physicians who knew how to administer digitalis and quinine just as Sydenham was almost the only physician who knew how to use opium. Drugs hold secrets which some veritable magicians discover after years of practice. The drawing up of a perfect prescription demands knowledge as well as common sense. Potain's clinic was a happy one, much more human than that of the Saltpêtrière where the patient was regarded as simply a specimen of a certain disease. The marvellous kindness of the chief shone right through the wards, eliminating that grim and unsavoury impersonality which weighs so heavily on poor people in hospital. The patients of Potain could never forget the extraordinary care with which, his examination finished, he laid down the chief principles and the details of treatment, contrasting so much with the hurried prescriptions of other doctors.

Daudet tells us that Potain was weakly and delicate and very plain to look at. As a grateful mother put it: "How his mother must have wept on looking at him as a child, but what joy for her in heaven when she saw him doing his daily work."

At the age of nineteen Daudet joined the surgical side of the Hôtel-Dieu under Tillaux, whom he describes as a safe practitioner of scrupulous honesty, but without the breadth of view of Potain. The rudimentary antiseptic treatment then in vogue used to flood the beds with the stinking spray of carbolic acid. At the St. Louis Hospital there were three distinguished men, Péan, Besnier and Fournier. Péan, the surgeon, he praises as a fine man, kind and generous, extremely clever with his hands like a professional juggler, a brilliant operator, knowing his own faults and ever ready to listen and to learn. He contrasts him with Pozzi whom he describes as a man of fabulous ignorance, full of pretensions, laughed at by students and doctors; and with Doyen, who was a clever operator but a mediocre clinician, who ignored his mistakes and obstinately shut his eyes to everything which went against his hobbies and queer ideas.

He describes Péan's operation seances in which he sometimes removed three legs and two arms, disarticulated two shoulders, trephined five skulls, whipped out half a dozen uteri and several pairs of ovaries. At the end of two hours, he was streaming with blood and sweat. Only a Hogarth, Daudet says, could paint this frightful scene, this scientific massacre which seemed like a butcher's shop.

Of Lucas-Championnière at the Hôtel-Dieu, Daudet cannot speak highly enough. He was the first to apply

rigorously Pasteur's principles to surgery. In his wards he gave a lesson by the meticulous cleanliness of the beds, of the clothes of his assistants, and of the instruments. He operated without hurry with the greatest care and was most conservative in regard to the limbs and tissues of his patients. His kindness and thoughtfulness were never exhausted by his long years of practice. He was, notwithstanding his modesty, one of the finest figures of French surgery.

Professor Besnier, the skin specialist, was an expert rather than a physician; at his clinic he examined first by general survey, then with the aid of a magnifying glass, the rare conditions which his colleagues sent to his consultations. As others recognize, on first examination, a Reynolds, a Gainsborough or a Nattier, this famous dermatologist diagnosed without hesitation a psoriasis, a purpura, an exfoliative dermatitis. Then he questioned the students as to their diagnosis and explained mistakes. So perfect was his demonstration that when one went out from his clinic the walls with the notices posted on them seemed like diseases of the skin and they were named instinctively, this, that, or the other. What Daudet noticed in this master of his special department was his indifference to the general state of the patient, to the diatheses which might have provoked these eruptions. The only thing which interested Besnier seemed to be classification of skin diseases by categories, varieties and faint differences.

Professor Alfred Fournier and his son Edmund Daudet could not praise too much. They, by their long experience of over forty years becoming the greatest syphilographers of the age and probably of all time, have given to humanity one of its most important keys; if it does not open all locks, it certainly opens three-quarters of them. The microbe of that terrible curse, the treponema, is at once the whip of genius, of talent, of heroism, and of *esprit*, as it is the cause of general paralysis, of tabes and of almost all forms of degeneration. (Edmund Fournier was a fellow student of Daudet.)

Nothing demonstrates better the advantage of a profession passing from father to son—if Edmund had not had at his disposal the case books of Professor Alfred Fournier and the benefit of his long experience, he would never have been able to write these incomparable treatises which upset from top to bottom the theories of degenerescences and opened a new outlook on heredity.

Daudet lays great stress on the disease as affecting successive generations and on its influence on the history of nations. He mentions incidentally the slow Stokes-Adams pulse, the persistent headache, the snuffles, the larval epilepsy and the diplomatic and political aberrations of Napoleon as due to hereditary disease.

When Daudet was in Tillaux's wards, Pasteur, whom Tillaux held in highest respect, came to commence his treatment against hydrophobia. Six Russian peasants had been bitten on the face and hands by a mad wolf. For eight days Pasteur came regularly to direct injections of his serum which Tillaux carried out. This great man was of charming simplicity and good nature; a little difficulty in his movements, hardly perceptible, indicated to the informed eye that he had had a slight stroke, which, however, had failed to do aught than to sharpen his genius.

> We followed his entrance with a veritable veneration and listened greedily to his least remark, watching his eyes which shone with an infinite intelligence. On the ninth day one of the peasants developing the disease was isolated and I shall never forget the frightful faces of his companions as they tried to stop their ears with their huge fingers mutilated by the wild beast. Day by day another was attacked, their desperate cries sometimes muffled, sometimes rising to a shriek, could be heard outside of Notre Dame. Terror reigned in the hospital. In their torture chambers, the poor fellows lay twisted, cramped on their beds or rolling on the floor frothing at the mouth, shreds of their sheets between their teeth. During quiet intervals between the seizures they begged us to kill them and put an end to their sufferings. The first of them had already died. Pasteur and Tillaux decided to yield to their prayers and a pill prepared by the chief chemist of the hospital was administered to each of them. When silence fell upon the ward like a great winding sheet we all were so unnerved that we were moved to tears. I personally felt from that day how grim and dismal a career was that of medicine.
>
> We were filled with admiration for Pasteur in persevering with his injections even when the six cases were hopeless; his opponents had a fine opportunity for railing at the failure of his remedy. But he was one of those few who valued a good conscience more than his reputation.

At the Charité one of the extraordinary sights was the clinic of Dr. Luys where he busied himself with hysteria and hypnotism, and had collected all the nervous cheats of Paris, light women sometimes very pretty, regular hangers-on of the hospitals, trained to the comedies of simulated seizures, of dreams, of suggestion frauds. The unsuspecting Luys was like a big white parrot describing the extraordinary sonambulism of Sarah, Suzanne and Lucy, and the phase of their hallucinations while they fluttered about and pinched themselves to prevent them from bursting with laughter. By the use of tightly corked bottles of the contents of which they were supposed to be ignorant, purging or vomiting was produced. They read books with their eyes bandaged, and unknown objects at a distance were described.

In the midst of this quackery, [illegible] buffoonery papa Luys remained imperturbable—these tests confirmed his favourite thesis; that was the main thing.

The hysterical Sarah was shown a corked tube marked "Castor Oil"—the first row of spectators held their sides; the professor did not budge, he awaited till the intestinal spasm developed and then cast a victorious look on all the audience.

In order to keep his subjects in close touch with him he permitted them to indulge in all kinds of caprices, to transform their hospital beds into boudoirs laden with ribbons, flowers, trinkets and daubs, and brought them scent, fine linen and sweetmeats. Imagine the life these Parisian wenches had in the absence of their patron. They rehearsed their performances a week in advance, asked for advice from the students, quarrelled about the leading roles, the best tricks, scratched one another and boxed one another's ears. They were like a cage of cats drunk with valerian. Sometimes one of them told tales and warned Luys: "Sir, I must tell you, they are making a fool of you." But he listened without understanding. On the nonsense of these women he had built his theory of sleep, another of waking, a third on the relations of body and soul, a fourth of the soul alone. He never could realize that he was being gulled; in the long run people took pity on him and lost all interest and pleasure in the game.

Among the salons of Paris of these times the most important one was that of Madame de Loynes who received the homages of the literary, the scientific and the political world. She was admired not only for her intellectual gifts, but for her natural goodness, her liberality and her charity. Here Léon had the privilege of meeting many lions of the day, Zola, Dumas *fils*, Goncourt, Maupassant and others. A great friend of Madame de Loynes, of Alphonse Daudet and of Charcot was Dr. Landolt, even in 1886 one of the leading ophthalmologists of Paris. Many years before it became known, Landolt diagnosed developing general paralysis in Maupassant and kept it as a secret for seven years.

Amongst others whom Daudet knew were Brouardel, the professor of medical jurisprudence, Debove who amused Charcot by his whim for washing out the stomachs of his unfortunate patients, Berthelot the chemist. Germain See, who then enjoyed a great reputation and whom he met at the sick bed of his father-in-law Victor Hugo, he describes as a man of poor ability. Babinski and Brissaud he regarded as men of great brilliance, though too much inclined to submit to Charcot's views. Brissaud he admired especially for his magnificent work as a clinician and by the way in which he unravelled the most complicated cases presented to him.

When he was in the army, Daudet was for some time attached to the military school of Val-de-Grace, which he describes as a model hospital with a teaching staff of most eminent men, Villemin, Kelsch and Cazel.

Although Léon Daudet himself had no personal experience of Duchenne de Boulogne, his father Alphonse was a personal friend not only of Duchenne but of old Dr. Privat of Lamelou, from whom Léon gathered most of this information. Duchenne was the great authority on neurology before Charcot's time. He was the first to publish descriptions of *locomotor ataxia*, progressive muscular atrophy, labio-glossal laryngeal paralysis. A very independent man, he detested officialdom of any kind. Every day with his rudimentary electrical apparatus he used to visit the hospitals getting permission from the medical staff to work at what he called his little experiments. Some received him politely, others recognizing his cleverness and filled with jealousy, made fun of his "silly tricks" before their students. But Duchenne put up with this, so absorbed was he in his dreams.

Dr. Privat, passing through Paris and talking to him one day, said: "You must come and see me at Lamelou, I have there under treatment some queer cases of rheumatism which may be very interesting to you." Lamelou was a watering place much visited from the earliest times by sufferers from pains and weakness of the legs. Dr. Privat described how Duchenne arrived one night with his shabby bag and little electric machine. After a light supper he went to bed. Rising early in the morning and looking out of the window, Duchenne saw several people walking to the baths. He rushed into Privat's bedroom who called out, on waking with a start; "What's the matter, have you broken your machine?" "No, no, listen to me, Privat—they are, the people walking on the street, throwing their legs about like this [Duchenne imitated them], I know them, they are ataxics, they belong to me. I am going to question them, all, all of them." Immediately with a fever of research and a joy which made him tremble with excitement, with the instinct of a hunting dog, the savant commenced his inquiry. From time to time, without sleeping or eating, he forced old Dr. Privat to write five hours a day to his dictation. In two weeks he had established the syndrome of tabes, its ocular and bladder troubles, its lightning pains, its incoordination in walking, all that we know today. "How marvellous it was", said Dr. Privat, "to assist this portraiture (the master adding each day a stroke or a colour) which was to live for ever." Duchenne, coming to stay a week with his host, remained three months at Lamelou.

Duchenne, according to Daudet, deserved a statue long before Charcot was so honoured.

INTRACRANIAL DAMAGE IN THE NEWLY BORN.[1]

By T. Y. NELSON,
Sydney.

IN this paper it is not proposed to examine the causes of intracranial damage in the newly born or to suggest the means of prevention, about which the obstetricians might have something to say, but to consider the clinical aspects of the established condition and the possibility of more active treatment than we have been accustomed to carry out in the past.

It has been pointed out that many of these infants are stillborn or die within a few hours of birth, and it is well known that there are many in whom the damage is small. Some of these will recover without any residual defects, and in some the problem will be to improve the function of a spastic limb, or it may simply be a matter of accommodation of the child to loss of function if, for example, one or more of the cranial nerves has been damaged. But there is a considerable group in which the damage is great and the symptoms are so severe that the question of survival is in doubt; it is to this group that I wish to refer.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on December 12, 1946. Dr. Mary Heseltine also read a paper on the same subject at the same meeting.

INTRACRANIAL HÆMORRHAGE.

The sites at which hæmorrhage may occur have been worked out in large series of cases, and there is general agreement as to their relative frequency. It is essential from the clinical point of view to attempt to correlate the symptoms of the different groups with the site at which the hæmorrhage is found, and it is this aspect of Craig's important paper that makes it such a valuable contribution to the subject. Table I gives the sites of hæmorrhage in two series of cases, and it will be found that the findings are in general agreement with those in the series presented by Dr. Heseltine. It will be noted that in the first series there is considerable overlap, showing that in a number of cases hæmorrhage occurred in more than one site.

TABLE I.

Site.	Author.	
	Weyhe, quoted by Ford (122 Cases).	Craig (126 Cases).
Intracerebral ..	35	6
Intraventricular .	21	22
Subarachnoid ...	56	36
Subdural	80	62

CLINICAL FEATURES.

There are certain symptoms that are common to nearly all types of hæmorrhage if it is of clinical significance. In most cases the symptoms are present within twenty-four hours, but they may be delayed for two or three days. The child is partly asphyxiated at birth and this state persists. Respiration is difficult to establish, and the child cries feebly and will not take the breast.

Intracerebral Hæmorrhage.

Craig found that intracerebral hæmorrhage occurred in large children delivered at term after a prolonged labour. In two-thirds of the cases it was associated with a forceps delivery, and was characterized by a vague onset, progressive decline in weight and extreme physical weakness, ending in coma and death.

Intraventricular Hæmorrhage.

It is generally agreed that hæmorrhage into the ventricles is associated in almost every case with prematurity. Capon states that babies so affected are almost exclusively stillborn; but Craig found that the condition occurred in infants in whom the signs of intracranial disturbance did not appear until after the first week.

> Symptoms were characterized by a severity which was the more striking occurring as they did in premature infants. Bulging of the fontanelle was visible to the naked eye. The cry and expression betrayed agonizing pain in a manner not typical of any other intracranial condition.

In all cases death rapidly followed the onset of symptoms.

Subarachnoid Hæmorrhage.

Rydberg found that in almost all cases of intracranial hæmorrhage, whatever the site, evidence of blood in the subarachnoid space was found, as demonstrated by spinal puncture, and it is this fact that has led to the statement that up to 10% of all babies show evidence of intracranial hæmorrhage.

Small and moderate effusions are probably absorbed rapidly without ill-effects, and it is only when the

hæmorrhage is extensive that it becomes of clinical importance.

Craig found that in the subjects who came to post-mortem examination, the clinical signs were vague rather than distinctive. Most of the babies were premature, and the symptoms were sometimes delayed until after the first week of life. Persistent absence of desire for fluids was noteworthy, and the infant failed to gain in weight. There was no bulging of the fontanelle, and convulsions or twitchings were rare, being associated only with extensive bleeding.

Subdural Hæmorrhage.

From the clinical point of view, babies with subdural hæmorrhage comprise the most important group, not only from the fact that all observers are agreed that it is the largest in number, but because this group offers a prospect of treatment which in a few cases may be the deciding factor in recovery and in others may prevent the occurrence of disabling sequelæ.

The practicability of locating subdural collections of blood in infants has been demonstrated by Ingraham, and although his series of 98 cases included cases of hæmorrhage occurring in the first twelve months of life, he estimated from the history and duration of symptoms that about one-third of these were the result of birth trauma.

Craig found that his cases occurred in mature infants, and that more than half were associated with forceps delivery. There is constant reference in the literature to the association between forceps delivery and intracranial damage, but very little reference to the fact that the indication for delivery by forceps is the prolongation of labour beyond a reasonable time, with consequently greater opportunity of damage to the fœtal head, and Craig mentions that half the forceps deliveries in his series followed rotation, either manual or instrumental, of the presenting head. It is interesting to note that an obstetrician, in assessing the factors causing intracranial damage, stresses the fact that proper application of forceps with an episiotomy protects the head from damage.

Of the positive signs suggesting subdural hæmorrhage, vomiting, convulsive movements which may be generalized or may involve the face only or the extremities only, and moderate distension of the fontanelle, are the most valuable. The convulsive movements may be provoked by mild stimuli, and if the hæmorrhage extends into the posterior fossa, head retraction will probably be seen. The tendon reflexes are usually exaggerated.

Craig drew attention to the mental condition of these patients and to the presence of other less constant signs.

> The facial expression became increasingly one of mental restlessness and distress, and contrasted with the existing physical inactivity. This early characteristic change was appreciable on the first day of life in three cases, on the second day in sixteen, and on the third, fourth and fifth days in five, four and one respectively; it occurred as the first evidence of trouble in the second week of life in the two remaining cases. These infants lay awake with widely opened eyes for prolonged periods: their eyes followed moving objects or were directed towards the sources of sudden or loud sounds. The apparent interest of these infants in their surroundings was unnatural; their expression conveyed an impression of apprehension and was that of children several months old rather than of newborn infants.
>
> These were very constant findings, as were those relating more particularly to the eyes. Blinking was common. The majority of cases showed darting, lateral movements of the eyes which were frequently stimulated or aggravated by sudden fright (e.g., due to noise). Some nystagmus subsequently developed in a proportion of these cases. Other occasional findings included ptosis and strabismus.

Another sign which is said to be diagnostic of intracranial hæmorrhage is the quick darting protrusion of the tongue seen in a number of these infants, to which the name "adder tongue" is given. Craig also noted successive periods of improvement, irritation and depression in these cases—a sequence very suggestive of the "in and out" effect on consciousness which has come to be recognized as a valuable symptom in cases of subdural hæmatoma in adults.

In the children that survive and come under observation at a later period, Ingraham noted that there was a constant temperature irregularity—sometimes a persistent elevation and at others a persistent reading below the normal level. Retinal hæmorrhages were common, and at times optic atrophy was seen. The children also failed to gain in weight satisfactorily.

Diagnosis.

From a consideration of the above-mentioned symptoms, it is possible to form a tentative diagnosis of subdural hæmorrhage, which can be confirmed by the insertion of a lumbar puncture needle through the coronal suture two centimetres lateral to the angle of the fontanelle; at this site blood will be found if the hæmorrhage is of any considerable size. The needle should be fitted with a guard so that only 0·5 centimetre of the tip of the needle is projecting. By this diagnostic puncture Ingraham maintains that the diagnosis of subdural hæmorrhage can be made in all cases, but one feels that there are small collections of blood which may be missed, and the following case illustrates this point.

An infant, aged two days, was admitted to the Royal Alexandra Hospital for Children with a history of forceps delivery following protracted labour. There was a depressed fracture of the right parietal bone, and twitching of both upper and lower limbs was present, more especially on the left side. These "pond" fractures are not usually associated with signs of cerebral irritation, and this unusual feature suggested the possibility of some intracranial hæmorrhage.

Subdural aspiration was performed; on the left side this procedure produced only a few drops of clear fluid, but on the right side one millilitre of old dark blood was evacuated by the needle. After this no further twitching occurred, and the infant's progress was satisfactory. One week later a small burr hole was made in the parietal bone and the fracture was elevated. At the same time the opportunity was taken to open the dura to estimate the extent of the hæmorrhage. No blood could be found, and only normal cortex was seen. At the same time, subdural aspiration was again performed through the coronal suture and 0·5 millilitre of blood was evacuated. The further progress was uneventful.

Treatment.

The occurrence of convulsive seizures is not a feature of adult subdural hæmatoma, but receives particular mention in all the descriptions of the condition in infants. It is difficult to determine whether the presence of subdural fluid is the cause of convulsions or whether they are due to underlying cortical injury; but it is impressive to see the clinical improvement that follows the withdrawal of even small amounts of blood from the subdural space. Ingraham's method is gradually to decompress the brain by withdrawing amounts of 15 to 20 millilitres of fluid per day by aspiration, and after one or two weeks to make a burr hole in the temporal region to note whether sufficient fluid has been removed or whether membrane is present which will require later craniotomy for complete evacuation.

Up to the present the writer has not encountered a hæmatoma in the newly born which would lend itself to this treatment, and the only purpose that subdural aspiration has served is to make the diagnosis. One wonders whether Ingraham's description applies only to the large collections diagnosed at a later date. The treatment adopted is illustrated by the following case.

A female infant was delivered by forceps after an obstructed labour. Both sides of the face were bruised, and the child was listless and would not take the breast. On the third day a convulsive seizure was observed, in which twitching and spasticity of the right side were seen. The fontanelle was moderately full but not tense. On the fifth day subdural aspiration was performed; it produced a few drops of clear fluid from the left side and two millilitres of old dark blood on the right side. Two days later a similar amount of thick blood was removed from the right side and the child's condition had improved considerably. Five

days later aspiration was again performed and a similar amount of blood removed. It was now apparent that this treatment was unlikely to remove the subdural blood entirely, and consequently three days later, when the child was fifteen days old, a burr hole was made in the right temporal region and a considerable amount (possibly thirty millilitres) of dark blood sucked out. One month later a burr hole on the left side revealed a moderate amount of xanthochromic fluid, which was sucked out. Apart from a urinary tract infection the subsequent course was uneventful, and five months later the baby was developing well.

In this case all the factors were present that make for success—early diagnosis and appropriate treatment carried out at the earliest opportunity. It is difficult to speculate on what would have been the late results in such a case if the treatment had not been carried out; but it is known that subdural collections of blood become encapsulated, increase in size by osmosis and produce pressure effects by their size. It is therefore conceivable that children examined at a later stage with compressed brain and pressure effects have the origin of their trouble in conditions such as were seen in this case.

Not all cases have this satisfactory ending, as is illustrated by that which follows.

A child was admitted to the hospital at the age of six weeks. It was a first baby, and after a normal labour had been delivered without forceps. There was some difficulty in establishing respiration, and the baby was cyanosed. Twitching of the left arm and leg was noticed in the second week, and a diagnosis of intracranial hæmorrhage was made. When the child was admitted to hospital the general condition was satisfactory, but frequent twitchings of the limbs were still observed. Subdural aspiration produced xanthochromic fluid on each side.

One week later a burr hole was made in the left temporal region and a large amount of fluid was removed from the subdural space. Two weeks later a burr hole was made in the right temporal region and a similar large amount of fluid removed. In spite of these procedures there was no reduction in the severity or the frequency of the convulsive movements. Five months later, when the child had improved physically, a flap was turned down on the left side and a small amount of membrane was removed. The late result is that the child still has convulsive seizures, is microcephalic with spastic limbs, and at the age of eighteen months is still unable to sit up.

It is difficult to understand why cases in which the initial signs are similar should have such different end results, and it seems to the writer that this can be explained only on the supposition that in some cases irrecoverable damage to cortical cells is caused by the initial anoxæmia during the birth and that others escape it. This seems more likely than that the late effects are due to the pressure of accumulated fluid, or that the patients are suffering from a primary agenesia of the brain and that the hæmorrhage is only incidental. There seems to be no method of distinguishing in the early stages between the two types of cases, and if the presence of blood in the subdural space can be established, it seems to the writer that this should be evacuated as early and as completely as possible.

CASES AND RESULTS.

In the last eighteen months a number of infants have been examined with a tentative diagnosis of intracranial hæmorrhage, and the presence of subdural hæmorrhage has been established in six. Of these, four have developed comparatively normally after treatment, and two are grossly mentally deficient with spasticity of the limbs. In addition, two children were examined at the age of six months, suffering from spasticity and backwardness, and no improvement followed removal of subdural fluid; the shrunken brain did not expand, and there was no improvement in the clinical condition.

It is realized that such a small series is of no statistical importance; but the cases are presented in the hope that the present discussion will stimulate further interest in this important subject.

ACKNOWLEDGEMENT.

The majority of the cases have been diagnosed by Dr. Kathleen Winning, whose enthusiasm and interest in the subject have made this paper possible.

BIBLIOGRAPHY.

N. B. Capon: "Intracranial Traumata in the Newborn", *The Journal of Obstetrics and Gynæcology of the British Empire*, Volume XXIX, 1922, page 572.

W. S. Craig: "Intracranial Hæmorrhage in the Newborn", *Archives of Disease in Childhood*, Volume XIII, 1936, page 89.

F. R. Ford: "Diseases of the Nervous System in Infancy, Childhood and Adolescence", 1937, page 755; "Birth Injuries of the Central Nervous System", Medicine Monographs, Volume XI, 1927.

J. E. J. King: "Intracranial Hæmatomas", *The American Journal of Surgery*, Volume LIX, 1943, page 248.

F. D. Ingraham and D. F. Matson: "Subdural Hæmatomata", *The Journal of Pediatrics*, Volume XXIV, 1944, page 1.

F. G. McGuiness: "Significance of Intracranial Injury of the Newborn with accompanying Hæmorrhage", *The Canadian Medical Association Journal*, Volume XLVIII, 1943, page 206.

THE PRESENT POSITION OF ALLERGY.

By BERNARD M. B. RILEY,

Physician in Charge of the Allergy Clinic, Royal North Shore Hospital of Sydney.

TEN YEARS' experience in the study of allergic conditions in a public hospital clinic and in practice as an allergist has assisted me to realize the faults of the methods so far adopted and the alterations required to make the work more efficient and the results more satisfactory. To state that, in New South Wales at any rate, the study of allergy has not received the attention that it warrants and deserves, is an understatement. The result is that the methods of investigation and treatment of the allergic subject are far below the standard of those attained in the United States of America and in Great Britain.

It is no exaggeration to state that the consideration of whether an allergic factor is present or not must enter into the discussion of the differential diagnosis in a vast number of cases. It is estimated that 10% of the population of the United States of America possess some allergic factor in their make-up, and that pollens are the greatest offenders as causative agents. In view of the fact that in Australia there is no part of the year when pollens are not present in the atmosphere, it is reasonable to suppose that they are equally as potent irritants as in the United States of America.

There is no denying that allergic manifestations are prevalent among our people; this is illustrated by the fact that in a public hospital clinic and in private practice, I have examined 12,000 patients suspected of having an allergic factor accounting for or aggravating their symptoms. Every week an average of over 220 patients attend for treatment at the allergy clinic of the Royal North Shore Hospital of Sydney. This cannot be attributed to the pleasure that many seem to derive from a regular visit to an out-patient clinic, as most of the patients are on their way to work and are greatly inconvenienced and handicapped by losing pay during the period of their absence. Moreover, the majority receive an injection, and we all know the prevailing horror of "the needle".

Why it is, then, if there is such a demand for investigation and treatment of allergic conditions and for research into its mysteries, that so little has been done here in comparison with other parts of the world? In my opinion the following factors play a part.

1. Insufficient stress is laid on the importance of the study of allergy during the training of medical students, with the disastrous result that the young graduate displays very little knowledge of the subject and far less enthusiasm with regard to it. Until recently it has been a rare occurrence to see a resident medical officer or a medical graduate as a visitor to the allergy clinic at the

Royal North Shore Hospital; the reason, I feel sure, is that their appetite for this intriguing subject has never been stimulated.

2. Many medical practitioners have a curious attitude towards any investigation or treatment of allergic conditions. This varies from disinterestedness to almost active antagonism at times, and patients are told that the idea that their condition is due to an abnormal sensitivity to some inhaled substance or to a food is fantastic. Equally frequent is the remark that nothing can be done for asthma, and therefore it is no use doing anything further. A less dangerous attitude, and one also frequently encountered, is that the patient's condition is allergic, but that he or she will grow out of it, and no further investigation is suggested. Fortunately, to combat these drawbacks to the progress of the further study of allergy, there are many medical practitioners who are "allergy-minded", and who find their knowledge of and interest in the subject of great assistance, both to themselves and to their patients.

3. There is an erroneous idea that the investigation of an allergic condition consists of a few skin tests, which either disclose the causative factor or fail to do so, and that in the former case a few injections are given and the patient is cured, or in the latter nothing further can be done. Skin tests are a small part of the investigation of an allergic patient; at the most they are a help, particularly if a positive skin reaction can be supported by a positive response on clinical trial with the substance used in the skin tests. Negative results to skin tests by no means exclude the possibility that the test substance is an offender; after all, it is asking a lot of the skin to illustrate always what is irritating the nasal mucous membrane or the gastric mucosa or the vascular tissue; the wonder is that the skin so often does accurately track down the culprit. More important than actual skin testing is the taking of a careful history, stress being laid on the nature of the condition—whether it is seasonal or not, the presence of allergic conditions in the parents, *et cetera*. A careful history will give one a fair idea of whether the condition is of allergic origin or not, and of the possible offender or offenders, before any skin tests are carried out.

4. Perhaps the fact that in the majority of allergic conditions the results of treatment are not sufficiently dramatic to attract attention accounts for some of the lack of interest in the subject. Certainly one cannot talk of cures, because allergy is not a disease, but represents a state of altered reactivity; of necessity the alteration of this state must be a tedious process. However, there are several conditions other than allergic manifestations which test the patience of physicians and surgeons, so this can hardly be a possible explanation. No, the subject is sufficiently interesting if the seeds of enthusiasm are sown at the correct time and in reasonable abundance.

5. The prevailing attitude towards allergic conditions was clearly illustrated during the war, and the comparison between our approach and that of the American army officials is most interesting. The American medical services established allergy clinics in every area, and huge numbers of subjects were investigated in operational areas. Those who were considered unfit for front line service, such as the man with severe asthma and the persistent sneezer who might be a menace in a forward observation post, were sent home; others with less severe conditions were treated and made useful combatant troops. On enlistment every soldier was questioned with regard to allergic conditions and a family history suggestive of allergy, and many recruits were discarded. Thus the liability of the country with regard to pensions after the war ended was lessened.

Our recruits received little or no investigation from the point of view of allergy, and were merely asked to sign a paper stating whether they had ever had asthma. The result was that many found their way into the forces, to be regular attendants at regimental aid posts and hospitals, and were eventually discharged, to become eligible for pensions without ever having been able to perform the duties of a soldier efficiently. Even under the close scrutiny of the American system, many allergic conditions escaped detection, so naturally large numbers of our unfit men found themselves in khaki. Furthermore, any attempt to investigate and treat allergic conditions in the army was frowned on by those in authority, on the ground that it involved pandering to the troops and giving them something else to justify their attendance at sick parades.

6. Finally, the apparent lack of knowledge of allergic manifestations in the child clinics is serious, for it is here that the primary stages of the allergic state and allergic dermatitis are most commonly seen. Allergic nasal conditions such as excessive rubbing of the nose (well named "the allergic salute") and urticaria and even asthma are also commonly present. If these conditions were detected and not put down to "teething", as is so frequently done, many a child would have his allergic career considerably shortened, if not completely abolished. Every child displaying allergic dermatitis is a potential asthmatic, and if the offending substance can be detected, the more serious stages of allergy such as asthma and hay fever can at least be lessened; this is of vital importance.

Now, what can be done to remedy all these defects?

First and foremost, I consider that students should receive more instruction in the frequency of occurrence of the allergic state in their patients, and in the importance of allergic manifestations particularly in young patients, as allergic symptoms can be detected even in the first weeks of life. It would not be over-ambitious for me to suggest that those in charge of prematernity clinics should also make special inquiries about the presence of allergic factors in the expectant mother, as the hereditary influence seems to be transmitted far more frequently through the female than through the male. Allergic mothers could then be instructed to watch for the early signs of an allergic factor in their infants, such as skin rashes, cyclical vomiting, nasal mucous membrane irritation, *et cetera*.

I frequently examine children, aged ten or twelve years, suffering from asthma, who give a history of allergic dermatitis as infants, of frequent "colds" in early childhood, and finally of asthma, without any record of previous investigation from an allergic point of view. The impression of the parent is that the child has had a teething rash and has then caught cold every week or so; this condition more often than not has been treated by removal of tonsils and adenoids, but no suggestion has been made that the condition may be an altered reactivity to some food or inhalent, and that it may not be due to the normal physiological act of dentition or to infection.

Students should be encouraged to attend allergy clinics. Then at least they will learn that the history taking is something different from the history taking in the usual medical or surgical case, and that allergic conditions are much more frequent than they have ever imagined and have probably accounted for some of their "missed" diagnoses. At present consideration of a possible allergic factor may be their last resort; I feel confident that it will eventually be one of their first thoughts. At least it will be useful in their oral examinations as a "possible" in a differential diagnosis.

I am not suggesting that allergy is often the complete answer to the problem of a patient's symptoms; it is sometimes, but only rarely. Hay fever is a typical example of a condition in which allergy may be the sole cause, hypersensitivity to pollens accounting for all the patient's symptoms; if this can be corrected, all the symptoms disappear. More often the allergic factor plays a slight but important part; it may be only an aggravating factor, or it may be the means of lessening the patient's general resistance to disease, thus enabling infection to gain a more solid footing. This is frequently found in conditions of the upper part of the respiratory tract, in which a mild allergic state paves the way for infection; this accounts for the more distressing of the patient's symptoms.

Secondly, I hold that more efficient clinics should be established—preferably one or two well-equipped clinics rather than several "mushroom" types of clinic at individual hospitals. Team work is the popular system today, and in no sphere is it more desirable than in an allergy clinic. At present there is no standard method of investigation and treatment; various lines of investigation are explored, different substances are used in skin testing and different methods employed, and types of treatment range from hyposensitization to intranasal antrostomy.

A central clinic with a laboratory, where patients could be classified and the most suitable treatment for that particular patient could be planned, would give the best results; no one type of treatment is suitable for all allergic conditions. The team in charge of the clinic would consist of the following members. The physician would carry out the preliminary investigation—the history-taking, examination of the respiratory and cardio-vascular systems, *et cetera*—and make recommendations for X-ray investigation, blood counts, estimation of the sedimentation rate *et cetera*, as he thought fit. The allergist would then carry out skin tests and ask for consultation when it was required. The biochemist could make stock extracts and also extracts of the patient's own material—house dust, animal hair—for testing and treatment, when stock extracts were not considered satisfactory. All patients should be examined by an oto-rhino-laryngologist, as it is most essential to determine whether any infection of the upper part of the respiratory tract is present in addition to the allergic factor. My experience is that nasal abnormality is commonly associated with allergic conditions, and for this reason I agree with Unger that "rhinopathy" is the best term to cover both conditions, rather than the term "rhinitis", which suggests an inflammatory condition and does not indicate the true mechanism of the allergic reaction. One can then speak of "allergic rhinopathy" or "infective rhinopathy". If infection is discovered, the allergist and the oto-rhino-laryngologist must determine which of the two conditions, allergy or infection, is causing more disturbance, and which should be treated first. The dermatologist, psychiatrist and pathologist could be associated as consultants; but all would be necessary, as allergy is closely linked with all the specialties, and it is only by the cooperation of all that the correct perspective can be achieved, and the various factors, allergic and otherwise, placed in their order of importance. An almoner is essential to the working of an efficient clinic. She should be a trained sister, who could visit the homes of patients and see that instructions were being carried out. She could also give injections for treatment to those unable to attend the clinic, or in case of *status asthmaticus* under instruction from the clinic, thus saving the overworked general practitioner many visits for the administration of adrenaline. Finally, there should be a botanist in the team, who could collect pollens for testing and treatment and carry out research in connexion with pollen surveys. These would help to bring the clinic to a standard not excelled anywhere in the world. If material for testing and treatment was thus produced in the clinic, it could be worked economically and with great satisfaction to the patient; there is no doubt that its results would be far in advance of those obtained under present conditions. All allergists could have their clinics, and methods could be standardized and research attempted in the many perplexing problems such as standardization of extracts, *et cetera*.

In the present state of affairs an allergy clinic cannot possibly carry out a satisfactory investigation. Patients have to be referred to separate departments for investigation, and a large majority grow weary before they reach the stage at which their allergic manifestation has been accurately assessed and treatment can be started. It is my opinion that when a patient is referred to a clinic today, it is only reasonable to ask whether the patient has an allergic factor in his make up, and if so, what treatment is suggested. This, of course, may be all that the medical officer referring the patient requires to know; but it is unsatisfactory from the point view of the allergist, who has very little opportunity to investigate the patient thoroughly, because he has not the machinery to do so and very often never hears of the patient again. Thus the valuable information of a "follow-up" is lost.

Thirdly, I suggest that the medical practitioner read more about allergy. Very little on the subject appears in this journal, and for this all practising allergists must equally share the blame; but Bray's "Recent Advances in Allergy" and Dr. Creip's latest book give an excellent general survey of the subject. For up-to-date reading *Annals of Allergy*, which is the official journal of the American College of Allergists, cannot fail to stimulate interest in this attractive subject. In this way wrong impressions can be corrected, and the reader will better realize the possibilities of allergy and also its limitations, so that he will be able to select patients suitable for reference to allergy clinics.

Finally, I urge a closer association of those interested in allergy, and I am pleased to know that a start has been made to form a Section of Allergy within the New South Wales Branch of the British Medical Association. By this, those wholly engaged in the practice of allergy will be able to make an effort to stimulate more interest in this important subject. The long distances that we are compelled to travel in this country make interstate cooperation difficult; but it is hoped that each State will form a section of allergy, and that eventually allergy will come into its own with the formation of an association of allergists composed of men from all States.

One vital drawback, which requires a quick remedy, is the time taken for the modern, scientific methods of treatment to reach us through the commercial houses. Substances such as "Hapamine" were in common use in the United States of America for many months before they were available here; now "Benadryl", "Pyribenzamine" and the food "Propeptans" have yet to come, although they have been in constant use in other parts of the world for a considerable time. Recently I was sent a *questionnaire* from the American College of Allergists, asking me to answer several questions relating to my experiences with "Benadryl" over the past twelve months; I was compelled to admit with shame that I had not used it because it was not available in this country.

We may have an insular outlook in some regards, but we should not let it be applied to our medical standards. In most branches of medicine and surgery I think we can proudly feel that our standards equal those of the rest of the world; but in allergy I fear there is a lag, which must be rectified with more clarity than the taxpayers' lag. Will those interested in allergy please see to it?

Reports of Cases.

TWO CASES OF NARCOLEPSY.

By GEORGE GOSWELL,
Research Fellow in Anatomy, University of Sydney.

THE two cases described below, in which a diagnosis of narcolepsy has been made, present features which are considered of interest. The term narcolepsy has in more recent times come to be used in relation to a group of disorders characterized by transient attacks of sleep, and we find such writers as Kinnier Wilson speaking of "the narcolepsies" as a series of conditions with such transient "sleepy" attacks as their common features.

Earlier writers on the subject have been more limiting in their classification. The first report is apparently by Westphall in 1877, but more often quoted is a case described by Gelinean in 1880. The latter patient suffered from repetitive sudden irresistible attacks of "sleep", associated with fits of absolute powerlessness developing with emotional experiences. At this time the condition was regarded as an hysterical manifestation, and it came to be known as narcolepsy. After this a number of

cases were reported in which either one or both of the characteristic features of the original case were present, and some controversy developed as to the significance of the double symptomatology. Lowenfeld, in 1902, stressed the importance of the two features and held that the term narcolepsy should be applied only to patients presenting them both. On the other hand, Gowers, in "The Borderland of Epilepsy", sought to discriminate between the sleepy states, and maintained that narcolepsy referred only to brief fits of sleep interrupting apparent normality. The term cataplexy, which is used to describe the attacks of powerlessness, was introduced by Henneberg in 1916. Full reviews of the literature, which now contains reports of several hundred cases, are given by Adie, by Wilson, by Levin and by Daniels.

The term narcolepsy is now in fairly general use, in a collective sense, to include a group of disorders which have for their basic feature a repetitive sudden irresistible urge to sleep. In many ways the use of the word is analogous with present-day usage of the term epilepsy.

The following two cases present fairly typical histories.

Case I.

G.F., a female patient, single, aged twenty-eight years, had felt perfectly well until a year earlier. At about this time she noticed a feeling of weakness every time she laughed heartily. On several occasions she fell down, or dropped objects she was carrying. Soon it was noticed that not only laughter but other changes in emotional tone produced the same effect. She could feel the weakness coming on, and was able to arrest it by stopping laughing. In this way she developed a method of coping with the threat of falling down. Very soon after the onset of these attacks she had a dream which frightened her considerably. About the particulars she is a little vague, but remembers a sense of limitation, and a woman dressed in black threatening her. Within a few days of this dream, she began to suffer from pronounced marked disturbance of her sleep habits. She began to suffer from repeated attacks of intense sleepiness, and found that she could not resist them. Attacks came on in all manner of places, and at any time—in trains, at dances, at work, and even while she was sitting up talking.

Eye-witnesses have told this patient that at times, when she succumbed to an attack while working, she would carry on with whatever she was doing, although on waking she had no memory of what had happened. When they began these attacks occurred about once per day, but recently they have become more frequent, although now occasionally a period of twenty-four to forty-eight hours goes by without any occurring. The duration of each attack varies from a few seconds to several minutes, and she states that during it she freqquently has dreams. Her sleep at night is normal, and apart from a short period during which she was undergoing treatment, she has had no sleeplessness. From the sleep of the narcoleptic attack she can always be aroused by a touch or by spoken word.

Four months ago she first attended the out-patient department, where treatment was commenced with "Benzedrine sulphate" in a dose of 15 milligrammes per day, slowly increasing to 45 milligrammes per day. This produced some improvement; but she experienced difficulty in sleeping at night, and adjustments were made in the time of taking the drug. After that there was a reduction in the number of attacks, but they still occurred, so she was admitted to hospital for further investigation.

She gives a history of a "nervous breakdown" six years ago. This took the form of somnambulism and attacks of hallucinations, but the cause for it could not be detected. She has had no other significant past illness. Her mother and father are alive and well, though they have been separated for many years. She denies that this in any way worries her now. Her mother is an epileptic. The seizures are infrequent now, but in her earlier life occurred as often as three or four times per day. They are apparently of the *grand mal* type. The patient has two brothers, one of whom also had "fits" from early childhood to the age of fourteen years. These were diagnosed by the local medical practitioner as epilepsy; but now the entire family is extremely vague about these seizures.

Physical examination of the patient revealed no abnormality. Her systolic blood pressure is 134 millimetres of mercury and her diastolic blood pressure 82. She is a cooperative, intelligent woman, but is extremely introspective and worries considerably over the nature of her condition. Examination of the cerebro-spinal fluid gave the following information: the fluid was under a pressure of 135 millimetres of water; the protein content was 20 milligrammes *per centum*, no cells were seen and the fluid failed to react to the Wassermann test. An examination of the patient's blood gave the following findings: the erythrocytes numbered 4,530,000 per cubic millimetre, the hæmoglobin value was 98 *per centum*, the colour index was 1·09; leucocytes numbered 6,600 per cubic millimetre, 69% being neutrophile cells, 27·5% lymphocytes, 2% monocytes and 1·5% eosinophile cells. Electroencephalography gave a tracing which was regarded as being within normal limits. Air encephalography was performed under local anæsthesia; 25 millilitres of air were injected by the lumbar route, and good filling of the ventricular system was obtained. X-ray films taken showed the lateral, posterior and inferior horns, and the third ventricle to be normal in size, shape and position. There was no evidence of any expanding lesion in the surrounding tissues.

At about this time the patient began to complain of blurring of her vision, so the administration of "Benzedrine sulphate" was discontinued. Ephedrine sulphate, one-third of a grain three times a day, was substituted, but she once more found difficulty in sleeping at night, so the dose was reduced to one-third of a grain twice a day. Under this treatment she felt well, and was almost entirely free from symptoms, so she was discharged from hospital. Since that time the improvement has been maintained.

Case II.

R.T., a male patient, a widower, aged thirty-two years, had been well until six years earlier. He then began to experience sudden atacks of transient weakness in the limbs and an irresistible urge to sleep. His legs felt as though they were "too tired" to support him, and his eyes would not stay open. This was a momentary phase invariably passing into "sleep", which lasted for periods varying from a few seconds to ten to fifteen minutes. At first these attacks were infrequent, but they gradually occurred more often until at their peak they came on three or four times every day. The patient states that he is not aware of any incidents or circumstances which can be regarded as being constantly associated with the occurrence of the seizures. They came on in varied circumstances; at times he has succumbed in positions which made so doing extremely dangerous. His nose now bears lasting signs of trauma which resulted from his falling on to a wall at the onset of an attack. Some months after he first experienced these symptoms, the patient noticed that when he laughed or became angry he suddenly lost all power in his limbs. He would crumple up and slide to the floor, and he has frequently dropped objects he was carrying in his hands.

At this stage he sought medical attention and was admitted to hospital for investigation. He is a well-built, athletic-looking man with no obvious disability. He states that as a child he was struck on the head by a piece of falling timber, but does not know whether he lost consciousness or not. Apparently he was not admitted to hospital after this injury. He gave no history of any other significant illness.

Clinical examination revealed no abnormality. The patient's systolic blood pressure was 146 millimetres of mercury and his diastolic pressure 82; the basal metabolic rate was +6%. Examination of the cerebro-spinal fluid gave the following findings: the fluid was under a pressure of 140 millimetres of water, the protein content was 20 milligrammes *per centum*, cells numbered four per cubic millimetre (lymphocytes), and the Wassermann test failed to produce a reaction. Air studies of the ventricles were made; ventriculography was performed, and good filling resulted. There was no evidence of any space-

occupying lesion in the cerebral hemispheres, and the ventricular system appeared normal in size, shape and position.

An electroencephalographic recording was regarded as being within normal limits. He was given "Benzedrine", five milligrammes three times a day, and after a period of observation during which his condition appeared to be somewhat improved, he was discharged from hospital.

Nothing was heard of this patient for some time after his discharge from hospital; but during the preparation of this report communication was again made with him and he came to the hospital. His more recent history is as follows. Since his discharge from hospital his symptoms have persisted, although on the whole the attacks occur less frequently than before. They have not qualitatively changed at all since his previous investigation, but he now gives a vivid picture of the attack. He has no warning sensation or apparently any objective sign, and the first sensation is of extreme weakness. This is rapidly followed by an overpowering desire to sleep. The whole stage is very short, occupying a fraction of a second, and consistently passes into loss of consciousness or "sleep". From this he can be aroused by a spoken word or by being shaken. On one occasion, while waiting to see the writer, the patient suffered an attack and slid to the floor. Rapid clinical examination at that time revealed no abnormality. He still experiences the attacks of powerlessness following emotional experience. These, he states, have not materially altered since their onset. At this stage, "Benzedrine sulphate", five milligrammes three times a day, was of little help to the patient, so he was tried with ephedrine sulphate, one-third of a grain three times a day. This has proved of some value, and now, although the attacks continue to occur, they do so infrequently, and he is able to continue with his work and live a relatively normal life.

Discussion.

The condition from which the two patients described in this paper are suffering is almost identical with that described by many earlier writers as narcolepsy. The double symptomatology has been elevated to the status of a "*morbus sui generis*" by Adie; but this concept has been denied by a number of other writers, notably Wilson. The occurrence of the characteristic symptom complex in association with a number of extremely diverse and varied pathological states, and the observations of so-called cryptogenic cases, do not appear to warrant such a classification.

Gelinean regarded his case as an hysterical manifestation, and since that time a number of authors have produced evidence in favour of a psychopathological origin of the disorder. A great number of other workers, however, have reported the symptoms developing in association with a wide variety of morbid states. From these observations has been developed a classification of narcolepsy on an ætiological basis into such groups as the following: (i) traumatic; (ii) toxic-infective, as in encephalitis; (iii) epileptic; (iv) endocrine or metabolic; (v) psychopathological; (vi) due to cerebral vascular disorders; (vii) due to tumours, especially in the region of the third ventricle; (viii) cryptogenic. Associated with this classification, there was necessarily an attempt to localize areas of the brain, involvement of which would produce the symptoms. Such efforts have been singularly unsuccessful. Sleep has been the subject of a great deal of experimental work in recent years, and the body of evidence, both clinical and experimental, points to the periventricular grey matter in the walls of the third ventricle as the area in which is vested the control of this function. More precisely, various workers have ascribed sleep regulation to several more or less discrete parts of this region; the anterior end of the third ventricle, the walls of the posterior part, the adjoining tegmentum, the mammillary nuclei, and the margins of the rostral opening of the aqueduct of Sylvius. In any case, the phenomenon of sudden, repetitive attacks of diurnal sleep, of short duration, can hardly be explained solely by a lesion of any of these areas. Much the same type of observation can be made in the case of cataplexy, except that in this case there have been very few successful attempts to reproduce the conditions experimentally by either irritative or destructive lesions. Harrison, however, does report the development of the typical cataplectic attack in a cat following a destructive lesion of the posterior part of the hypothalamus.

As Wilson pointed out, the investigation of the ætiology of narcolepsy must involve a consideration of several similar and not infrequently associated conditions. Thus we have narcolepsy, sleep paralysis, geloplegia and catalepsy, all relatively distinct entities, yet all having certain common features. These were interpreted by Wilson as manifestations of the spread of Pavlov's internal inhibition in varying degree to cortical and subcortical levels. Although there are a number of deficiencies in this suggestion, it does in the main serve to explain the various phenomena. More recently Fabing has critically analysed this concept, and has attempted to elaborate it further to explain several of the more perplexing features of the disorders. Two of the most difficult questions are: Why should emotional experiences produce inhibition of motor activity? What is the quality of the emotional stimulus which will produce the cataplectic response? Fabing introduces the Pavlovian concept of ultraparadoxical response to supramaximal stimuli as the basis of these phenomena. As Pavlov pointed out, up to a certain maximal level, the intensity of the response to a conditioning stimulus is proportionate to the intensity of the stimulus; but beyond this maximum the responses are abnormal. In these responses to supramaximal stimuli there were three types of reaction: equivalent, when stronger stimuli produced responses no greater than weaker stimuli; paradoxical, when the responses in relation to weak and strong stimuli were reversed; and ultraparadoxical, when the response to stimuli was inhibition. There was some variation in these responses, and in certain animals the ultraparadoxical response predominated. Fabing suggests that the stimuli which produce the cataplectic response are massive, and, postulating that the brain of a narcoleptic patient is more susceptible to inhibition, he regards the cataplectic response as an example of Pavlov's ultraparadoxical phase. It is also suggested that the manifestations of catalepsy, sleep paralysis and narcoleptic sleep are the result of summation of repeated stimuli producing the ultraparadoxical response, and that the differences in these phenomena lie in the fact that the inhibitory processes spread to different parts of the cortex and subcortical areas.

The theory is attractive, in that it offers an explanation at a common level for such varying yet frequently associated conditions. It is a matter for consideration whether the events which produce the cataplectic attack, or those preceding the onset of the other types of seizure, are constantly such that the ultraparadoxical response will be produced. Furthermore, the concept requires the distinction among central nervous systems of a group which are more susceptible to inhibition. The confirmation of such postulations is unlikely to be found until the exact nature and mechanism of inhibition are understood. However, in the absence of any proof to the contrary, it seems feasible to accept a spreading wave of inhibition as the most likely underlying cause.

The relationship between narcolepsy, catalepsy and sleep paralysis can hardly be disputed, in view of their repeatedly observed concurrence in patients, and the similarity of certain features in each condition. The relationship to the epilepsies, however, has been more hotly contested. Curschmann and Prange, Adie, Kahler, Goldflam (to name a few) have denied that there is any connexion between the two groups. On the other hand, Wilson asserts that such claims are not valid, and Gowers, Stewart, Wilson and many other writers have reported cases in which narcoleptics developed epilepsy. Cohn and Cruvent stress the familial incidence of the disorder, as well as a familial relationship to epilepsy, in their series of ten cases. In this regard, the electroencephalographic studies of narcolepsy have been interesting. These recordings have been found to fall into three groups: (*a*) perfectly normal tracings, (*b*) tracings showing δ waves typical of those seen in normal sleep, (*c*) tracings with features similar to those seen in epilepsy especially

of the *petit mal* type. Such findings have also been recorded at the local electroencephalographic unit.

There can be little doubt that narcolepsy has become more prevalent in recent years. After the first reports, there were occasional descriptions of cases for a time, and Wilson states that although he was house physician to Sir William Gowers in 1906, and became conversant with the features of the condition, he saw no definite examples in twenty years. In 1928 he records it as remarkable that he encountered six cases in one year, and in 1933 Levin was able to collect "more than 200 cases". The condition is more frequently encountered in males, the relative proportions having been variously assessed at from 6:1 to 4:1 (Wilson 4:1, Cave 4:1 in 32 cases, Redlich 4:1 in 100 cases). The age incidence appears to be significant; of 98 cases reported by Redlich, the age of onset in 50 varied between ten and twenty years, and in a further 23 between twenty and thirty years.

It is interesting to note that in the first case described in this paper, the patient, who gave a familial history of epilepsy, also experienced hallucinations of a threatening character on several occasions. A similar phenomenon was described by Lhermitte in 1932 in association with lesions of the posterior portion of the hypothalamus. Brain, in 1939, also discussed this feature in relation to narcolepsy, and regarded it as an intermediary between dreaming and hallucinoses. This patient also exhibited behaviour during attacks which was similar to automatism following *petit mal*, although she gave no evidence of any other epileptic signs.

The prognosis in narcolepsy will clearly depend upon the presence of any underlying or associated pathological state. There is no evidence that the cryptogenic type has any influence on the expectation of life, although the condition may exist for many years unchanged. The experience of a number of observers in finding that narcoleptics developed epilepsy later should also be borne in mind, although this is apparently not of frequent occurrence.

Treatment of this condition is largely symptomatic, although cases have been recorded of the complete spontaneous disappearance of symptoms. A great number of drugs have been tried, but most without any success. Probably the most satisfactory measure is the regular administration of excitant drugs such as amphetamine and ephedrine in suitable doses. A popular preparation of the former is offered under the trade name of "Benzedrine Sulphate". Some improvement has also been reported following subdural insufflation of air, during the course of encephalography. In cases associated with a pathological state, the treatment is directed towards the primary lesion.

Summary.

1. A report of two cases of narcolepsy is given.

2. The possible ætiological factors are discussed, with special regard to the Pavlovian concept of inhibition, in relation to narcolepsy, catalepsy, cataplexy and sleep paralysis.

3. Certain clinical features of the condition, its progress and treatment are reviewed.

Bibliography.

W. J. Adie: "Idiopathic Narcolepsy: a Disease Sui Generis; with Remarks on the Mechanism of Sleep", *Brain*, Volume XLIX, September, 1926, page 257.

W. R. Brain: "Sleep: Normal and Pathological", *British Medical Journal*, Volume II, July 8, 1939, page 51.

W. R. Brain and E. B. Strauss: "Recent Advances in Neurology and Neuropsychiatry", Third Edition.

H. Curschmann and F. Prange: *"Ueber Einschlafsucht (Narkolepsie und Verwandtes)"*, *Deutsche Zeitschrift für Nervenheilkunde*, Volume LXXXVI, 1925, page 97.

H. A. Cave: "Narcolepsy", *Archives of Neurology and Psychiatry*, Volume XXVI, July, 1931, page 50.

R. Cohn and B. A. Cruvent: "Relation of Narcolepsy to the Epilepsies: A Clinical-Electroencephalographic Study", *Archives of Neurology and Psychiatry*, Volume LI, February, 1944, page 163.

L. E. Daniels: "Narcolepsy", *Medicine*, Volume XIII, February, 1934, page 1.

C. von Economo: *"Théorie du sommeil"*, *Journal de neurologie et psychiatrie*, Volume XXVIII, 1928, page 437.

H. D. Fabing: "Narcolepsy. II. Theory of Pathogenesis of the Narcolepsy-Cataplexy Sydnrome", *Archives of Neurology and Psychiatry*, Volume LV, April, 1946, page 353.

A. Gelinean: *"De la narcolepsie"*, *Gazette des hôpitaux civiles at militaires*, Volume LIII, 1880, page 626.

W. Gowers: "The Borderlands of Epilepsy", 1907.

S. Goldflam: *"Zur Frage der genuinen Narcolepsie und ähnlicher Zustände"*, *Deutsche Zeitschrift für Nervenheilkunde*, Volume LXXXII, 1924, page 20.

F. Harrison: "An Attempt to Produce Sleep by Diencephalic Stimulation", *Journal of Neurophysiology*, Volume III, March, 1940, page 156.

R. Henneberg: *"Uber genuine Narcolepsie"*, *Neurologisches Centralblatt*, Volume XXXV, 1916, page 282.

M. Levin: "Pathogenesis of Narcolepsy, with Consideration of Sleep Paralysis and Localized Sleep", *Journal of Neurology and Psychopathology*, Volume XIV, July, 1933, page 1.

J. Lowenfeld: *Münchener medizinische Wochenschrift*, Volume XLIX, 1922; quoted by Wilson, *loco citato*.

I. P. Pavlov: "Conditioned Reflexes: Air Investigation of the Physiological Activity of Cerebral Cortex", translated by G. V. Anrep, 1927.

I. P. Pavlov: "Lectures on Conditioned Reflexes", translated by W. H. Gantt, 1941, Volume II.

E. Redlich: *"Epilegomena zur Narkolepsiefrage"*, *Zeitschrift für die gesamte Neurologie und Psychiatrie*, Volume CXXXVI, 1932, page 128.

J. P. Stewart: "Narcolepsy", *Brain*, Volume LI, March, 1928, page 126.

G. Trahair: Personal communication.

Westphall: *Archiv für Psychiatrie und Nervenkrankheiten*, Volume VII, 1877; quoted by W. R. Brain and E. B. Strauss, *loco citato*.

S. A. K. Wilson: "The Narcolepsies", *Brain*, Volume LI, March, 1928, page 63.

S. A. K. Wilson: "Neurology", edited by A. N. Bruce, 1940, Volume II, page 1545.

PUZZLING FOOT SYMPTOMS FROM ABNORMAL NERVE DISTRIBUTION.

By J. R. BARBOUR, M.S., F.R.C.S.,

Department of Anatomy, University of Adelaide.

THIS case is reported because it shows how a recognized variation of cutaneous innervation of the dorsum of the foot produced a perplexing retention of sensation after section of the musculo-cutaneous nerve.

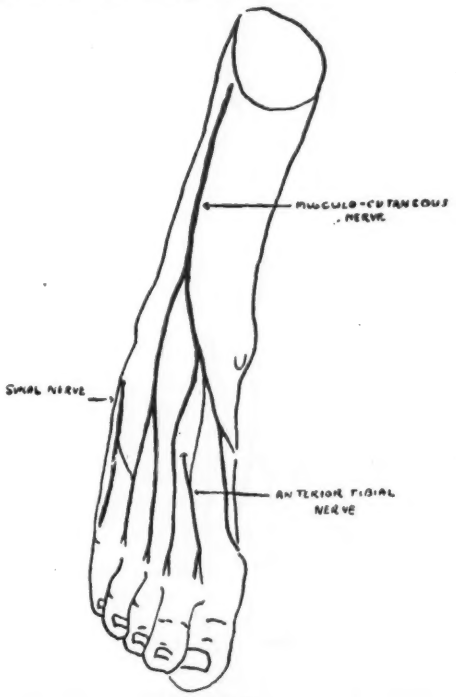

FIGURE I.
Cutaneous nerves of the dorsum of the foot; usual distribution.

The lower part of the right leg and the right foot of a young man were sent for examination to the Department of Anatomy, University of Adelaide, with the

following history. A lacerated wound had been sustained across the back of the leg, about five centimetres long and reaching to within four centimetres of the upper border of the *os calcis*. The posterior tibial nerve had been divided. After the wound had healed, an attempt

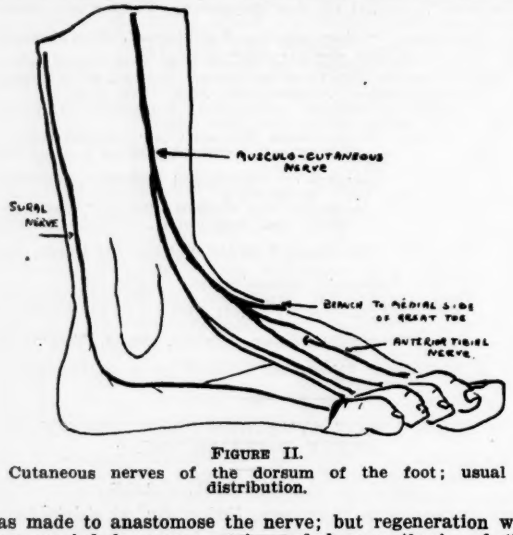

FIGURE II.
Cutaneous nerves of the dorsum of the foot; usual distribution.

was made to anastomose the nerve; but regeneration was accompanied by severe pain and hyperæsthesia of the sole. A similar condition had developed over the dorsum and outer side after the healing of the injury. The posterior tibial nerve was divided above the scar with

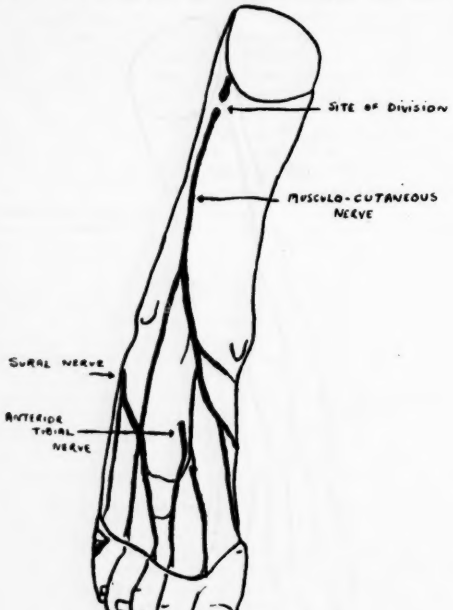

FIGURE III.
Cutaneous nerves of the dorsum of the foot; case under discussion.

relief of the pain and hyperæsthesia of the sole. The musculo-cutaneous nerve was also divided, but neither anæsthesia nor relief of pain over the dorsum of the foot followed.

The sketches in Figures I and II show anterior and antero-lateral views of the cutaneous innervation described in Cunningham's "Textbook of Anatomy", seventh edition. It will be seen that the sural nerve supplies the lateral aspect of the foot and the fifth toe, giving an anastomosing

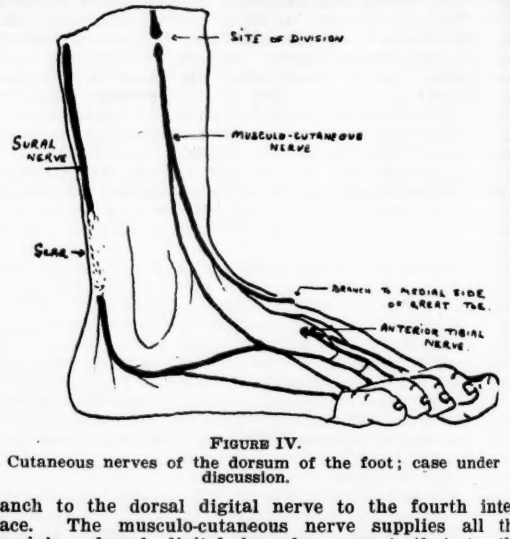

FIGURE IV.
Cutaneous nerves of the dorsum of the foot; case under discussion.

branch to the dorsal digital nerve to the fourth interspace. The musculo-cutaneous nerve supplies all the remaining dorsal digital branches except that to the first interspace, which comes from the anterior tibial nerve.

In the sketches in Figures III and IV, made from the dissected specimen, it will be seen that the sural nerve has an additional distribution as dorsal digital nerves to the two lateral interspaces. The two medial interspaces are supplied by the anterior tibial nerve. The musculo-cutaneous nerve supplies mainly the medial side of the first toe, while its normal distribution is represented by anastomotic branches to the sural and anterior tibial nerve.

Dissection showed the sural nerve to be involved in scar tissue at the site of the original wound. Microscopic examination disclosed that the nerve bundles were separated by dense interneural fibrosis. The unusually wide distribution of the sural nerve explains how this lesion produced pain over the dorsum as well as over the lateral border of the foot. The dissection also explains the absence of anæsthesia over the dorsum of the foot and toes after section of the musculo-cutaneous nerve.

Reviews.

A GUIDE FOR THE TUBERCULOUS.

DR. G. S. ERWIN'S excellent and modestly priced little "Guide for the Tuberculous Patient", which was noticed in this journal on August 18, 1945, has now appeared in a second edition.[1] A welcome new section is one dealing with the nervous stresses which affect tuberculosis; though, unfortunately, it is headed "Nerves", and it seems that the author has not much sympathy with neurosis, that very common complication of tuberculous disease. "Many of the patients who take their own discharge are neurotic", he writes, "for they exaggerate domestic and other concerns which are of much less importance than the serious treatment of their disease. This lack of a sense of proportion is characteristic." Alas, no ivory tower is proof against echoes of the hurly-burly without, and the higher the walls the dizzier the prospect. Dr. Erwin believes that "The tears of discipline are the waters of healing". It would seem to follow that the more tears shed within the sanatorium, the merrier the superintendent should be.

[1] "A Guide for the Tuberculous Patient", by G. S. Erwin, M.D.; Second Edition; 1946. London: William Heinemann (Medical Books) Limited. 6½" × 4", pp. 128. Price: 3s. 6d.

The Medical Journal of Australia

SATURDAY, MARCH 1, 1947.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

AN AUSTRALIAN TUBERCULOSIS ASSOCIATION.

DURING the last two decades no subject in the whole range of preventive medicine has been discussed in Australia more frequently and with greater earnestness than has the prevention of tuberculosis. To review these discussions would be an enormous task and one not likely to be of much profit. Two important groups of papers that have appeared in this journal should, however, be mentioned. The first group appeared in a "special tuberculosis number" on August 8, 1931. The contributors were Dr. J. H. L. Cumpston, Dr. F. S. Hone, the late Sinclair Gillies, and Dr. J. Bell Ferguson who wrote with Dr. H. M. James as co-author. These papers contained reference to a report by Dr. M. J. Holmes, published in 1929, and some of his recommendations were quoted by Dr. Hone. The second group of papers comprised those read at the fifth session of the Australasian Medical Congress (British Medical Association) at Adelaide in 1937. The subject of tuberculosis was the central motif of the congress and the papers at the plenary session were read by Dr. M. J. Holmes, Dr. L. B. Bull and Dr. Cotter Harvey. In these discussions particular emphasis was laid on governmental responsibility in tuberculosis control. Not that the obligations of the medical practitioner in the care of the individual patient were in any way minimized; on the contrary the practitioner's role was made clear, but his efforts, unaided by active and whole-hearted departmental action, were shown to be only partially effective. Adelaide has always been a centre of activity and agitation in the matter of tuberculosis, and it is perhaps significant that the last meeting of the Federal Council of the British Medical Association, at which the control of tuberculosis was given a good deal of prominence, was held in that city. The Federal Council has for many years tried to bring about progress in tuberculosis control and has latterly, as most readers are probably aware, been insistent that an adequate pension should be paid to sufferers from the disease, so that they would not be worried about the economic welfare of themselves and their dependants. At the last meeting of the Council in November, 1946, the recent amendments to the *Tuberculosis Act* were mentioned, and Queensland was described as the only State in which satisfactory payments were made to sufferers from tuberculosis. In a statement issued to the daily Press the Federal Council observed that grants recently made to the State Government by the Federal Government for an anti-tuberculosis campaign were absurdly inadequate. It added that the position had been reached where certain governments could not escape responsibility for loss and deterioration of lives. During the Council's discussion stress was laid on the commonly held view that the provision of treatment for tuberculosis sufferers was a government responsibility, and reference was also made to the activities of Dr. D. R. W. Cowan, of Adelaide, in regard to the establishment of a Commonwealth tuberculosis campaign. The President endorsed the views expressed and referred to the advisability of the establishment of a national association for the prevention of tuberculosis in Australia.

The idea that one tuberculosis association should be brought into being to cover the whole Commonwealth, originated in South Australia when the South Australian Tuberculosis Association adopted its new constitution in 1943. Among one of the objects was a determination "to foster the formation of an Australian National Tuberculosis Association". South Australian workers have contemplated the long list of reports, addresses and other papers that have appeared since the late W. Ramsay Smith, in 1909, sent to the Chief Secretary of South Australia a report on the control of consumption in that State, and have remarked on the consistent lack of effect that has been given to suggestions and recommendations contained in them. It is noteworthy that in 1911 a conference of principal medical officers reported on "uniform measures for the control of consumption in the States of Australia". In spite of the years of failure to achieve their objective, the South Australians have not been deterred. A representative of the South Australian Tuberculosis Association in the person of Dr. D. R. W. Cowan, paid a visit a few months ago to Sydney to confer with the Anti-Tuberculosis Association of New South Wales and with others interested in the subject. A draft constitution for an all-Australian association was submitted to a committee called in New South Wales for the purpose. The discussions were cordial and enthusiastic and it now appears likely that the objective will be attained. It was agreed that an association to be known as The Australian Tuberculosis Association should be formed and that it should consist of six branches, one from each State. There was full agreement on the value of such a body. It was thought that by its agency propaganda could be directed to State and Federal Governments and that this propaganda should be directed at increased efforts to eradicate the disease and to the securing of adequate economic relief for sufferers and their dependants. It was also thought that education could be undertaken by means of leaflets, films, radio and other talks, Press publicity and so on. A third advantage of an Australian Tuberculosis Association would be the encouragement of the study of tuberculosis in all its forms and relationships. Expressed in a few words, this new body will be a means for getting things done. With the proposed details of the constitution of the association we need not concern ourselves at the moment. Much of the set-up has been culled from the National Association

for the Prevention of Tuberculosis in England and from the constitutions of associations in Canada and the United States of America. What is needed is to create an enlightened public opinion, an opinion so strong and held by such numbers of people that governments in office will have to take notice. It is not for nothing that the Federal Council states publicly that certain governments cannot escape responsibility for the loss and deterioration of lives. When a body of doctors expresses this opinion, however solemn the conclave in which they meet, the chosen representatives of the people in Parliament can and do shrug their shoulders at what is to them only another of the doctors' complaints. If the opinion comes from a large body of the people who put the parliamentarians into their seats and can take them out if they wish, it is quite another matter. The new association is not to concern itself with treatment; it will help to create conditions in which treatment can be undertaken with the greatest possible benefit to the individual patient and also to the community. In regard to the community, it will not be possible always to distinguish between preventive and curative treatment. The ultimate aim is, of course, increase of the former and reduction of the latter until a stage is reached at which it will seldom need to be used.

The next step will be the acceptance of the idea by those concerned in the prevention and cure of tuberculosis in all the States and a willingness to form State branches of the Australian association. This means that the workers in the several States must be willing to accept the help of another agent to secure the carrying into effect of their plans in tuberculosis control. The one association will mean that workers in the States should be able to make simultaneous proposals dealing with some common aspects of the problem. This must be recognized as more likely to bring success than would varying proposals from individual States. The whole range of the tuberculosis problem would be covered. It is difficult to imagine anything that would be more helpful to a tuberculosis worker, whether he was a private practitioner or a departmental officer. The creation of an Australian Tuberculosis Association means that a certain amount of money will have to be found for its running—council meetings will have to be held and representatives will have to travel from distant centres. With efficient organization difficulties of finance will be overcome; in any case the problem of finance need act as no deterrent. On this question Sir Henry Newland once wrote: "If the question of expense is to be the lion in the path, then we shall never stamp out the disease." But the disease is certain to be stamped out some day; the building of a strong Australian Tuberculosis Association will help to bring that day nearer.

Current Comment.

STAGES IN TUMOUR GROWTH.

A NATURAL corollary to the discovery of carcinogenic substances was the search for agents by which cancer formation could be augmented or retarded. H. P. Rusch and B. E. Kline[1] state that the study of substances with "cocarcinogenic" or "anticarcinogenic" properties is of great significance in that it has thrown fresh light on the fundamental nature of tumour growth. They believe that cancer formation occurs as a series of biological changes rather than as a continuous single process, and that certain forces other than those actually involved in the genesis of the tumour cell are necessary for the formation of grossly perceptible neoplasms. These ideas are not new; they have been voiced before, but always in a rather nebulous way; there is as yet no unanimity about the precise role played by the various forces necessary for tumour formation. It seems that the growth of neoplasms is an even more intricate process than had previously been imagined. This very complexity, however, may bring the solution nearer; it is better to be faced with a labyrinth than to be up against a brick wall. In the experiments described by Rusch and Kline, methylcholanthrene (a known carcinogen) was dissolved either in benzyl alcohol or in wool fat and applied for various periods to the skin of albino mice. Wool fat had a pronounced retarding influence on the formation of cutaneous tumours; its effect contrasted sharply with the rapid growth of neoplasms observed when the carcinogenic substance was dissolved in benzyl alcohol. This inhibiting effect of wool fat on the carcinogenic activity of certain hydrocarbons has been established by other workers. Rusch and Kline found that when a solution of methylcholanthrene in wool fat was painted on mice for four months no visible tumours were found, but when the carcinogen was subsequently applied to the same area in a solution of benzyl alcohol tumours appeared very quickly; more quickly than if there had been no previous treatment. They suggest that the carcinogen during the second period of treatment merely stimulated the proliferation of existing tumour cells whose growth had been held in check during the first period by the wool fat in which the carcinogen was dissolved. This view is supported by the fact that croton oil, which is a tissue irritant but non-carcinogenic, could be substituted for methylcholanthrene during the second stage, with similar results. Wool fat greatly diminished the effects of croton oil in the second stage, as well as of methylcholanthrene during the first stage.

These results may be interpreted to mean that at least two properties of methylcholanthrene are essential for tumour development; one is responsible for the genesis of the tumour cell and the other stimulates cellular multiplication. Rusch and Kline discuss their own results and those of other workers in this field. As a working hypothesis, they suggest that the process of tumour formation may be divided into various phases. The first is a period of induction, during which the tumour cell is formed. Precancerous lesions have long been recognized in human beings as well as in experimental work; the period of induction, therefore, may be usefully subdivided into two phases: a stage of "preneoplasia" and a stage of genesis. The second phase may be called the critical period, or period of reversibility. During this time the growth of the cells is in delicate equilibrium with the influences of their environment, and depends on the balance between the proliferative capacity of the cell and the local tissue resistance. It may be supposed that there are so few neoplastic cells present that they are more or less lost among the normal cells and must compete with healthy cells for the nutrients in the fluids of the tissue spaces. We may imagine that during this time some tumour cells proliferate, some lie quiescent for varying periods, and others die. The notion of this critical period is supported by several types of experimental evidence. For instance, when a carcinogenic hydrocarbon is applied to the skin of mice for a time short of that necessary to induce tumours, the subsequent resumption of the hydrocarbon treatment will quickly precipitate the formation of tumours even though three or four months intervene between the two periods of application of the hydrocarbon. In certain cases a non-carcinogenic agent such as heat, a wound, or croton oil may be substituted for the hydrocarbon during the second period. It is known that tumour cells may persist in a quiescent state for as long as sixteen to twenty-nine weeks before perceptible growth is observed. The final outcome must be a balance of the various factors involved. The third phase, or period of

[1] *Archives of Pathology*, October, 1946.

progression, may be considered as that period when the neoplastic cells have gained ascendancy over the forces that had held them in control. The tumour acquires its own vascular supply and no longer needs to compete with normal cells for nutrition. Usually this is a stage of relatively unrestricted invasive growth. Experimental tumours can be studied in all stages; but in human beings cancer is seldom diagnosed until a perceptible tumour is present. It is, of course, always to be remembered that the results of experiments on animals apply only by analogy to the problems of human disease. Still, the possibility of the control of experimental tumours must give us hope.

The idea of a critical period, or period of reversibility, is of the utmost importance and also of fascinating interest. We know, from experimental work, a few of the substances that may hold the cell anarchy in check. There must be countless other factors that may play a part. It is impossible to know how often a potentially cancerous process comes to nought. Is the stimulus to tumour formation always something external or is it sometimes an inherent imperfection of living tissue? The possibility of wrong growth, mysteriously enough, does seem to lurk within the orderly beauty of living cells. It is almost as if there were "another law in our members", warring against the laws of normal growth, ready now and then to flare up into such wild and evil things as melanotic sarcoma or chorionic cancer. One might almost suggest that in every normal tissue, in every normal creature, this tendency to tumour formation is held in check by forces and conditions of which we still know very little, and that long life and health are, as it were, a victory after long warfare by hosts and hosts of normal, healthy, good-living cells. The study of experimental tumours in animals is only one of the ways in which we may hope to learn more of these things.

THE TEACHING OF DERMATOLOGY IN ENGLAND.

DURING the war years a good deal of attention was devoted to dermatology, mainly from the fact that in industry so many man-hours were lost owing to skin diseases. Amongst the causes of ill health and absence from duty seen in tropical areas disabilities of this kind came second only to the somewhat better known hot-country ailments, such as malaria and dysentery. At the Army Medical Directorate of the British War Office an adviser, raised later to the rank of consultant, was appointed so that dermatology might be put on a suitable footing. Scabies was one of the first subjects tackled, and as a result of new methods sufferers from this disease were no longer "hospital cases", but were treated "in the lines", so that the patients never left duty. In addition, consulting dermatologists were appointed to all large formations overseas, with a consequent reduction in wastage. This interest in skin diseases has spread over to peace-time and the Royal College of Physicians of London quickly realized that the teaching of dermatology was a fruitful subject for study. To this end a committee was appointed in 1945 with Lord Moran as chairman and Dr. Henry MacCormac as vice-chairman. The terms of reference to the committee covered two points: (*a*) the education of undergraduates and post-graduates in dermatology and (*b*) the making of recommendations to cover this branch of medical practice in the future.

The first and interim report, which was issued in the early part of 1946, discussed in general terms the establishment of a comprehensive dermatological service. It was considered that 180 whole-time dermatologists would be required in Great Britain to take charge of the necessary clinics on the basis of four per million population. This matter was carried further in a hospital survey of the London region, where it was suggested that for a population of 125,000 people there should be a general hospital of 600 to 700 beds for patients with acute dermatological conditions, or of 950 to 1,000 beds if those with chronic and infectious conditions were admitted. On this basis one dermatologist would be required for every two hospitals, and in addition each teaching hospital would require two dermatologists of consultant status. With regard to the number of beds to be set aside for teaching purposes, it was thought that 5% of the total beds in a teaching centre would be sufficient.

The final report, dealing mainly with the teaching of dermatology, has now been published. It deals with the teaching of the undergraduate and with post-graduate training. In regard to the first of these, the recommendations are comprehensive. First of all, the student in his preliminary years should be made aware of the more common animal and vegetable parasites "to heighten his interest in this branch of biology". Then it is held that during instruction in physiology the skin should be considered as an important structure in the maintenance of health and that general principles of physiology might be illustrated by reference to the demonstrable changes in the skin. This must mean nothing more than that the teaching of physiology should be complete; if it is complete it will cover every system and the skin will receive adequate consideration. A reference is made to the recommendation of the Goodenough Report that an introductory course should be the combined responsibility of the heads of the departments of medicine, surgery and pathology in order to illustrate the basic principles of general medicine. It is held that dermatological cases should be used in this course and that routine methods of examining the skin, the common skin changes and so on should be discussed during this course. In regard to instruction in the principles of dermatology, it is advised that this should be given as part of the general course in medicine. This will put skin conditions before the student in their true perspective. The student's "appointment" in dermatology should cover a period of three months, with attendance at least twice a week as a clinical clerk to in-patients and out-patients. The course would include lecture-demonstrations on the diagnosis and treatment of the commoner diseases of the skin met with in general practice. Another suggestion is that when the student visits factories under instruction of the department of social medicine, potential skin hazards should be explained. The committee approves of the suggestion made in the Goodenough Report that a departmental examination in dermatology should be held before the final examination.

In regard to the training of post-graduates, three groups are considered: (*a*) those intending to become consultants in dermatology; (*b*) those intending to become dermatological specialists, including physicians who undertake dermatology in their practice; (*c*) practitioners attending refresher courses. In Australia a sharp line is seldom drawn between consultant dermatologists and dermatological specialists. It will suffice for our present purpose to indicate what is regarded as essential in the training of a consultant. The course of training suggested is a five years' course after medical registration. The training suggested is set out under five headings: (*a*) appointment in the department of general medicine, resident or non-resident, for a minimum of a year after registration; (*b*) appointment in the pathological and bacteriological departments, to study the fundamentals of bacteriology, immunology, histopathology and biochemistry for a minimum of a year; (*c*) study of actinotherapy, radiotherapy, venereal diseases, fevers and industrial medicine; (*d*) clinical work as assistant or registrar in the dermatological department of the teaching institution; (*e*) a period of study abroad, including research in some branch of dermatology.

It must be remembered that the committee making this report in Great Britain has been working under the shadow of the proposed government health service. Even so, it is important that medical educationists in Australia should follow what is done in England and elsewhere in the training of specialists and in the devising of a hall-mark for them. Hall-marks will be looked for more and more in this country as time goes on, especially if specialists are to be registered as such.

Abstracts from Medical Literature.

SURGERY

The Pauchet Technique of Colostomy Closure.

G. B. SANDERS AND P. H. HALPERIN (*Surgery*, July, 1946) discuss the closure of colostomy openings and recount their experiences with the Pauchet technique. They point out that the conventional Paul-Mikulicz closure gives good results in civilian surgery with elective colostomy performed under ideal conditions, but that in many colostomies, and particularly in those carried out by military surgeons in the treatment of large bowel injuries, conditions are often very different. Thus there may be hernia, absence of spur, interposition of mesentery or foreign bowel between the limbs of the colostomy, or rotation of one limb upon the other. Most of these complications make the Paul-Mikulicz method hazardous or impossible. One alternative is to resect the colostomy and to practise end-to-end anastomosis, and the authors did this on a number of occasions. Dissatisfaction arose from temporary obstruction at the junction, due to œdema (which necessitated suction-decompression and repeated enemata and involved an added risk of leakage) and to the frequent development of a stenosis demonstrable radiologically and presenting a potential source of later trouble. The authors therefore decided to try the technique described by Victor Pauchet in 1934. The operation embodies the principles of a Finney pyloroplasty. The colostomy opening is completely mobilized from the parietes and delivered from the abdominal cavity. Complications such as bowel rotation or interposition or omentum *et cetera* can be corrected. The peritoneal cavity is then packed off and the closure of the colostomy carried out. A series of twenty-two consecutive closures were performed by this method, with no failures and with minimal morbidity and complications. Although Pauchet described the use of this method only in the sigmoid colon, the authors have used it with success as far round as the hepatic flexure.

Reconstructive Otoplasty.

PAUL W. GREELEY (*Archives of Surgery*, July, 1946) discusses methods of reconstructing the pinna of the ear. Earlier experience with the Gillies method of using a maternal cartilage transplant had been disappointing, and although in a series of fifteen cases the early results appeared promising, it was found that in two years or less the new ear became shrunken and deformed. This was due to aseptic necrosis of the graft and its replacement by fibrous tissue which underwent cicatricial contraction. The author, in search of a better support, decided to try tantalum, as this metal has been used so successfully by orthopædic surgeons and neurosurgeons with apparently minimal tissue reaction. It was decided to use the tantalum as a fine wire mesh in the interests of lightness and to permit the establishment of vascular channels through the open spaces. This method of reconstruction was used in a case of avulsion of an ear, and the mould has remained in place for over two years without reaction. The author considers the method deserving of further trial.

Obstruction following Gastro-Jejunostomy due to Biochemical Factors.

J. H. WOOLSEY (*The Western Journal of Surgery, Gynecology and Obstetrics*, August, 1946) discusses the part played by biochemical factors in causing stomal obstruction after gastro-jejunostomy. Recalling the tendency at one time to regard post-operative stomal obstruction as always due to mechanical factors, the author concludes now that œdema is most frequently to blame, and sets out to review biochemical factors which may be responsible. Principal among these are lowered protein and raised chloride levels in the plasma. Hypoproteinæmia may result from starvation, hæmorrhage, wound drainage, vomiting *et cetera*, while there is a danger that too much chloride may be introduced in intravenous infusions. The author concludes that nutritional œdema is the major cause of post-operative gastro-jejunostomy obstruction.

The Hazards of Parachuting.

P. ESSEX-LIBROSTI (*The British Journal of Surgery*, July, 1946), surgical specialist of the 225 Parachute Field Ambulance, discusses the manner in which the various injuries found after 20,777 jumps by men of the Sixth British Airborne Division were caused. He maintains that parachuting, although one of the greatest thrills in life, is almost as safe as crossing a crowded street and safer than playing army football. He presents and examines data provided by 20,000 jumps, the casualty rate for all injuries being 2·1%, of which 0·5% were so severe that the soldier could not have carried on fighting. The articles of equipment are described and the various hazards of exit, of development or filling of the parachute, and of handling are explained in detail, assisted by photographs and diagrams. The division had its own rehabilitation centre for the treatment of injuries which occur in the training of a division. The author describes some of the work of this centre and stresses the method by which the morale, discipline and *esprit de corps* of the injured man was maintained by keeping him as an integral part of the division while he was attending the centre for treatment.

Acute Intussusception in Infants and Children.

BRUCE M. HOGG AND EDWARD J. DONOVAN (*Annals of Surgery*, August, 1946) report a series of 123 cases of intussusception in nineteen years at the Babies' Hospital, New York City. The mortality rate was 13%, an improvement from that of 30% reported from the same hospital in 1923. The authors consider that this improvement has been achieved by better treatment after the patient's admission into hospital, because the duration of the disease prior to admission showed no appreciable decrease. No obvious cause was found in 83% of the cases; in 11% enlarged lymph nodes were described in the ileo-caecal region, Meckel's diverticulum was found in four cases, cysts were found in three cases, and a polypus in one. The authors follow the classification first suggested by Clubbe, namely: (1) ileo-ileal or enteric, (2) entero-colic or the double type, (3) ileo-caecal, (4) colic types. In their series 85% of the cases were ileo-caecal. The authors in the description of signs, symptoms and pathology in general confirm the views of other authors and lay stress on the factors of poor prognosis, such as duration over twenty-four hours, the enteric and the entero-colic types, and advanced progress towards the rectum, poor hydration and raised temperature. Nine of the authors' patients required excision, the mortality rate of this series being 55%. The authors feel that the use of a Mikulicz procedure may be of value in reducing the mortality in these cases. They strongly urge physiological rehabilitation by the restoration and maintenance of fluid balance and blood volume before and after operation, and they make a plea for earlier recognition of this well-established surgical emergency.

Congenital Hypertrophic Pyloric Stenosis.

EDWARD J. DONOVAN (*Annals of Surgery*, October, 1946) reports a personal series of 507 cases of hypertrophic pyloric stenosis in which operation was performed. He uses the Fredet-Ramstedt operation and stresses the immediate pre-operative preparation and the post-operative care. The success of modern surgical treatment, in which a cure can be permanently and easily achieved by a simple operation, continues to prove its superiority over extended medical treatment, with its prolonged and uncertain results. The author believes that the tumour is congenital, that the pylorospasm follows the hypertrophy and that the pylorospasm is responsible for the onset of symptoms between the second and fifth weeks of life. The clinical picture, the author points out, is impressively uniform—vomiting, during or after each feeding, the vomiting becoming projectile in type. The vomitus is never bile stained, but it may contain mucus and bright blood or coffee-ground material resulting either from the associated gastritis or from the rupture of a mucosal vessel during the act of vomiting. The baby may lose enough fluid by vomiting to become extremely dehydrated, to lose weight rapidly, to be constipated and to pass only small amounts of concentrated urine. The course is rapid and if fluid is not restored death may be expected from dehydration and starvation in about four weeks' time. The diagnosis depends upon the history of the course and on the palpation of a pyloric tumour, which is present in every true case and which is pathognomonic, being found in no other condition. Gastric peristaltic waves, although always present, their intensity depending upon the duration of the obstruction, cannot be considered diagnostic, since they occur in other conditions. The author feels for the tumour with the baby's stomach empty and the baby relaxed with a sugar pacifier. As he believes that the tumour can be felt in every case, he does not operate until it has been felt. Although diagnosis may be made by means of X rays, the author believes this to be not only unnecessary but actually contra-indicated, since it greatly increases the baby's post-operative discomfort if all the medium is not removed. In the pre-operative treatment restoration of the fluid lost by vomiting is the most important factor. The operation should

never be considered an emergency and no patient should be operated upon until he is completely hydrated. It is safe and in fact necessary in some cases to spend several days in preparing a baby for operation. The author uses hypodermoclyses of 80 millilitres of salt solution with or without glucose twice a day until hydration is complete. This point is determined by clinical observation rather than by laboratory tests. Transfusion of blood and the intravenous administration of fluids are practically never necessary. At operation "open-drop ether" is the anæsthetic of choice and a six-centimetre right rectus incision is made from one centimetre below and to the right of the xiphoid cartilage. After operation the baby is kept warm in the "pyloric room", from which visitors are excluded. Glucose and saline solution are given by means of a medicine dropper, the amount being increased until 30 millilitres are given every three hours at the end of twenty-four hours. An addendum to the paper is a summary of the work of Dr. Martha Wollstein, who made a study of healing after the Fredet-Ramstedt operation, based on material from twenty-three autopsies performed from twenty-four hours to two years after operation. A brief summary of important facts is as follows. After the Fredet-Ramstedt operation healing is brought about by cells of the serosa and submucosa, but the unstriped muscle cells take no part in the process. The incision in the pylorus is healed in nine days. The pylorus has become relaxed within two weeks. The stomach has returned to normal size within a month and the gap between the cut ends of the muscle coats has practically disappeared in six weeks. In two years only a thin line of connective tissue fibres separates these two muscle ends and the stomach is quite normal.

Embryonal Tumours of Kidney in Infancy and Childhood.

WILLIAM J. FUSARO (*The American Journal of Surgery*, October, 1946) states that embryonal tumours of the kidney are usually found in the first three years of life and that the frequent occurrence of renal tumours has been found to be responsible for the largest percentage of malignant disease in infancy. The tumours vary greatly in size and in 85% to 90% of cases are unilateral. They are encapsulated, retroperitoneal, and lie within the kidney capsule. The kidney itself takes no part in the tumour formation, and usually there is a layer of fibrous tissue between the neoplasm and the atrophied kidney, which is reduced to a shell. Histologically, the tumour is a mixed tumour, the usual cells found being composed of epithelial, fibroblastic and smooth muscle cells, and the striking feature is the embryonal character of the cells. In the majority of cases the presence of an extremely rapidly growing mass is the usual and only symptom. Pain is rare, and hæmaturia, casts and albumin are only late findings. In the differential diagnosis, enlarged spleen, liver, tumour, cystic kidney, hydronephrosis and pyonephrosis, hydatid disease, adrenal tumour, enlarged mesenteric glands, peritoneal cysts, tuberculous growths and ovarian cysts have to be considered. However, exploratory laparotomy is often needed to establish the diagnosis. Treatment may consist of surgery alone, of radiation therapy alone, of surgery with pre-operative radiation, of surgery with post-operative radiation, and of surgery with pre-operative and post-operative radiation. The prognosis is apparently poor with all metnods of treatment.

Management of Sharp-Pointed Foreign Bodies in the Gastro-Intestinal Tract.

R. RUSSELL BEST (*The American Journal of Surgery*, October, 1946) points out that the history of a patient having swallowed one or more sharp-pointed foreign bodies and the portrayal of these foreign bodies by X-ray examination usually bring some consternation to the attending physician or surgeon. As a rule those who have had the greatest experience in the management of such cases advocate careful observation and non-surgical treatment, while those with only isolated experience tend to favour surgical interference. The author had the care of twelve young adults who swallowed foreign bodies in an attempt to shirk strenuous duties in a disciplinary training centre. In two of the twelve cases operation appeared to be indicated and was successfully performed, although the author is inclined to believe that in one of these cases the patient's shrewdness established a picture which simulated early perforation. The author concludes that the treatment should be watchful waiting with careful fluoroscopic or X-ray examination. Only occasionally will operation become necessary. Perforation or penetration of the bowel is evidenced by abdominal tenderness, muscle rigidity, changes in pulse and temperature, and blood count. If the foreign body remains stationary beyond forty-eight hours, the author considers that the sharp point has engaged in the intestinal wall and that laparotomy should be carried out. During the observation period special diet is not necessary, although mineral oil in small amounts may seem indicated to prevent constipation in the distal half of the colon. Surgery should not be instituted on the history alone, but only on the appearance of threatening signs and symptoms of perforation or when there is more than a twenty-four to forty-eight hour delay in the passage of the object at any point along the gastro-intestinal tract.

One-Stage Tubed Abdominal Flaps.

DANIEL T. SHAW AND ROBERT L. PAYNE (*Surgery, Gynecology and Obstetrics*, August, 1946) have used a single pedicle abdominal tube in 31 cases, the object being to combine the advantages of the closed tube with those of the direct abdominal flap. By basing the tube inferiorly on the superficial epigastric and the superficial iliac vessels the authors have constructed tubes up to 18 centimetres in length and seven centimetres in width. The flap is outlined on the abdomen as two parallel incisions tapering to a blunt point superiorly. The donor defect is generally closed by a continuous subcuticular stainless steel wire and the flap is formed into a tube by interrupted sutures. By staggering the lower ends of the incision the base of the tube may be rotated either medially or laterally. These tubes have been found by the authors to be very useful in covering a defect of the hand or wrist, but such a tube may also be attached to the wrist for carriage to another portion of the body. They combine the speed of the abdominal flap with the cleanliness of the closed tube.

A Thoracic Support.

W. SPICKERS (*The Journal of Thoracic Surgery*, April, 1946) describes with illustrative photographs and drawings a simple attachment for the operating table to hold patients in a firm, comfortable position during thoracic operations. It consists of a horizontal plank of wood which rests on the table and has a shorter upright piece at right angles fastened at one end of it and a sliding wooden bar with thumbscrews to prevent the patient from turning or slipping. The patient lies on his well side, leaning obliquely forward against the upright; when he is satisfactorily placed the movable upright is pushed against his back and the screws are tightened.

Acute Secondary Parotitis.

W. A. ALTMEIER (*Surgery*, August, 1946) discusses the treatment of acute secondary parotitis, basing his remarks on experiences with 49 patients seen over a period of ten years. The patients' ages ranged from seven to eighty-four years, the average being forty-seven years. The infection was bilateral in four cases. All but two of the patients were debilitated by some serious disease or injury. The systematic administration of large doses of Lugol's iodine solution was used as the primary treatment in all but four cases. Three patients received penicillin and two were given both Lugol's solution and penicillin. The general plan of treatment consisted in the administration from the earliest opportunity of 120 to 250 minims of Lugol's solution per day. As improvement occurred the dosage was progressively reduced. The greater part was given by mouth, with smaller amounts by hypodermoclysis, proctoclysis or intravenous infusion. The average duration of iodine therapy was seven days, and the average total dose was 823 minims of Lugol's solution. The highest total was 2,880 minims. If a definite abscess was present before or at the start of treatment it was incised and drained. If an abscess developed during treatment it was likewise incised and drained in all but two instances, in which repeated aspirations were carried out. Other supportive measures included the use of massive hot compresses. The results of therapy with Lugol's solution in 46 cases are described as impressive. Complete spontaneous resolution occurred in 29 cases, and partial resolution with abscess formation in five. Definite improvement of their parotitis was observed in six other patients who died from the primary disease two to five days after treatment was commenced. Three patients showed no response. In the favourable cases little change was seen for thirty-six to forty-eight hours, and then improvement was rapid. The results of treatment with penicillin were very encouraging. One patient who failed to respond to therapy with Lugol's solution responded satisfactorily to penicillin. Three others treated primarily with penicillin had spontaneous cures. No evidence of iodine poisoning was seen during treatment. Its possibility should be kept in mind when massive doses are used.

Bibliography of Scientific and Industrial Reports.[1]

THE RESULTS OF WAR-TIME RESEARCH.

During the war a great deal of research was carried out under the auspices of the Allied Governments. It has been decided to release for general use a large proportion of the results of this research, together with information taken with former enemy countries as a form of reparations. With this end in view, the United States Department of Commerce, through its Publication Board, is making a weekly issue of abstracts of reports in the form of a "Bibliography of Scientific and Industrial Reports". This bibliography is now being received in Australia, and relevant extracts are reproduced hereunder.

Copies of the original reports may be obtained in two ways: (a) Microfilm or photostat copies may be purchased from the United States through the Council for Scientific and Industrial Research Information Service. Those desiring to avail themselves of this service should send the Australian equivalent of the net quoted United States price to the Council for Scientific and Industrial Research Information Service, 425, St. Kilda Road, Melbourne, S.C.2, and quote the PB number, author's name, and the subject of the abstract. All other charges will be borne by the Council for Scientific and Industrial Research. (b) The reports referenced with an E number may be obtained in approved cases without cost on application to the Secondary Industries Division of the Ministry of Post-War Reconstruction, Wentworth House, 203, Collins Street, Melbourne, C.1. Copies of these are available for reference in public libraries.

Further information on subjects covered in the reports and kindred subjects may be obtained by approaching the Council for Scientific and Industrial Research Information Service, the Secondary Industries Division of the Ministry of Post-War Reconstruction, or the Munitions Supply Laboratories (Technical Information Section), Maribyrnong, Victoria.

LOVELACE, W. R., *et alii*. Pulmonary ventilation of flyers. (Army Air Forces. Engineering Division. ENG-4-660-50-H.) Off. Pub. Bd., Report, PB 5128. 1944. 15 pp. Price: Microfilm, 50c.; Photostat, $1.00.

This is a report on data collected to determine the average ventilation of personnel in flight at various altitudes, and for active and inactive pulmonary ventilation. Summaries of the data, conclusions and recommendations are given.

FUHR, I., AND KRACKOW, E. H. Cyanogen chloride, LC 50, for rats: 2 minutes' exposure. (Chemical Warfare Service. T.R.L.R. 27.) Off. Pub. Bd., Report, PB 11553. 1944. 8 pp. Price: Microfilm, 50c.; Photostat, $1.00.

Tests show that the LC 50 of cyanogen chloride for rats exposed two minutes and observed fifteen days is 10·1 mg./l. It is recommended that concentrations of cyanogen chloride be determined in field tests both by bioassay and by chemical analysis. A chart and tables present test data. For tests on rabbits, see PB 11557, under Krackow, E. H., and on goats, see PB 11552, under McGrath, F. P.

ALEXANDER, S. F., and MICHEL, H. O. A study of blood viscosity and blood cellular concentrations in phosgene poisoning in the rabbit. (Chemical Warfare Service. Medical Division. MD(EA) Memorandum Report 51.) Off. Pub. Bd., Report, PB 11183. 1942. 10 pp. Price: Microfilm, 50c.; Photostat, $1.00.

Normal rabbits showed a wide variation in blood viscosity, total cell volume, hæmoglobin content, and red cell counts. When rabbits were gassed with phosgene, the changes in the above values were not constant nor predictable. Hæmoglobin determinations are a valid index of hæmoconcentration. Hæmoconcentration is a secondary mechanism and not the primary lethal factor in phosgene poisoning. Further study is recommended. Tables present test data.

BASMAN, J., *et alii*. The effects of mustard on muscle tissue. (Chemical Warfare Service. Medical Division. MD(EA) Memorandum Report 78.) Off. Pub. Bd., Report, PB 11345. 1943. 24 pp. Price: Microfilm, 50c.; Photostat, $2.00.

Mustard was instilled in amounts as stated in the protocols into the *longissimus dorsi* muscle on one side of the back of 12 rabbits. Blood counts and blood chemistries were obtained and at intervals of 24 to 120 hours the animals were sacrificed and the muscles and viscera taken for histological study. There was little or no change in the blood NPN, sugar, chloride or red blood count. Significant leucopenia occurred in each rabbit following instillation of mustard into the muscle. Mustard does not affect muscle tissue as it does the skin of the rabbit. Charts present autopsy data.

BODANSKY, OSCAR, and GINSBURG, T. H. The toxicity of sodium cyanide infused intravenously at measured rates and its relation to the toxicity of hydrocyanic acid by inhalation. (Chemical Warfare Service. Medical Division. MD(EA) Memorandum Report 107.) Off. Pub. Bd., Report, PB 11447. 1943. 27 pp. Price: Microfilm, 50c.; Photostat, $2.00.

The average fatal dose of sodium cyanide and hydrocyanic acid injected intravenously in rabbits and cats was determined, and it is pointed out that at rates of infusion of sodium cyanide up to 50 milligrammes or 1 micromol per kilogram per minute the fatal dose is inversely proportional to the rate of infusion. At rates of infusion greater than 50 microgrammes or 1 micromol per kilogram per minute the fatal dose is constant and is independent of the rate of infusion. Calculations of the respiratory intake in man indicate that, at concentration of HCN that may be used in chemical warfare, the rates of entrance of HCN into the circulation would most likely lie in the region of constant, maximal lethality. Illustrations and diagrams are included.

BOWERS, RUSSELL V., and KENSLER, CHARLES J. Diisopropyl fluorophosphate, physiological effectiveness on primates; study no. 2. (Chemical Warfare Service. T.R.L.R. 21.) Off. Pub. Bd., Report, PB 11549. 1943. 6 pp. Price: Microfilm, 50c.; Photostat, $1.00.

Tests were conducted to determine the effect of diisopropyl fluorophosphate on monkeys, and the data are presented in tabular form. Monkeys are the most sensitive species so far exposed to diisopropyl fluorophosphate. Existing incomplete data do not permit an evaluation of the sensitivity of man to this agent.

CHENOWETH, MAYNARD B., and GILMAN, ALFRED Z. The cardiac actions of methyl fluoroacetate. (Chemical Warfare Service. Medical Research Laboratory. MRL(EA) Report 19.) Off. Pub. Bd., Report, PB 9577. 1944. 34 pp. Price: Microfilm, 50c.; Photostat, $3.00.

Anæsthetized and unanæsthetized monkeys, dogs, cats, goats and rabbits that had received lethal doses of AFl intravenously were studied by electrocardiography. It was found that monkeys, goats and rabbits always die of ventricular fibrillation, although monkeys are markedly less susceptible to AFl than are goats and rabbits. Dogs and cats always die of respiratory depression following convulsions of central origin without appreciable cardiac abnormality. Blood pressure in anæsthetized animals was recorded by means of a carotid cannula and was found to rise slightly for a short period and then to fall slowly to shock levels. AFl acts directly on the myocardium and requires no *in vivo* chemical change by other organs to produce ventricular fibrillation. Protocols of monkey experiments and plates showing electrocardiograms of animals treated with AFl are appended. Bibliography.

DAVIS, MARION I. JEFF. Clinical and laboratory evidence of the non-toxic effect of lewisite vesicle fluid on the skin. (Chemical Warfare Service. Medical Division. MD(EA) Memorandum Report 82.) Off. Pub. Bd., Report, PB 11380. 1943. 13 pp. Price: Microfilm, 50c; Photostat, $1.00.

Fluid from lewisite blisters produced on one arm each of 168 soldiers was soaked up in a cotton sponge and left applied to the open wound and surrounding skin for twenty-four hours. This fluid in some cases was also transferred to the skin of the unburned arm. There was no evidence in either case that lewisite blister fluid had an irritating or vesicant action on the skin. No signs of irritation were produced by placing blister fluid in four rabbits' eyes and in the eyes of three human subjects.

PB 23079. PRENTICE, T. M. German naval hospitals. (U.S. Naval Tech. Mission in Europe Tech. Rept. 527-45), Oct., 1945. 12 pp. Price: Microfilm, 50c.; Photostat, $1.00.

The purpose of this investigation was to secure information of interest to the Bureau of Yards and Docks in regard to the structural and planning features of German naval hospitals and to compare German practice with that in the United States. This report contains a brief description of three German hospitals located at Neuenkirchen, Bremen and Bremerhaven. Only a brief report is given on the hospitals at Neuenkirchen and Bremen, which were found to be of no technical interest. The Marinelazarette at Bremerhaven, built in 1938, was found to have a fine modern building which compared favourably in many respects with modern United States naval hospitals. It is described in some detail. Plans of Neuenkirchen and Bremerhaven hospitals are included. These may not reproduce well.

PB 23365. U.S. STRATEGIC BOMBING SURVEY. The effect of bombing on health and medical care in Germany. (Rept. 65), Oct., 1945. 428 pp. Price: Microfilm, $4.50; Photostat, $29.00.

This is a report of the manner in which Allied air attacks on German cities and industries influenced the health of

[1] Supplied by the Information Service of the Council for Scientific and Industrial Research.

that country. It is neither a sanitary report nor a compilation of vital statistics, but rather a study of every facet of German health, an analysis of the health aspects of the surroundings in which the German people lived, what they ate, how they ate, how they were cared for medically, and how they were injured and died in the raids. In other words, this is a description of the manner in which a thoroughly regimented nation reacted to air raids. The subject headings are: civilian deaths from air attacks; the nature of air raid casualties; communicable diseases and other disorders; industrial health, vital statistics; medical personnel; medical education; hospitalization; environmental sanitation; food supply and nutrition; and medical supplies—development, production and distribution. Tables, graphs, diagrams, and photographs are included; appendices are attached.

PB 22302. BENZINGER, THEODOR. Physiological basis for the construction and use of stratosphere airplanes. (AAF ATSC T-2 Translation 467.) 1943. 36 pp. Price: Microfilm, 50c.; Photostat, $3.00.

This is a translation by the Air Technical Service Command at Wright Field, Dayton, Ohio, of a German report, *"Physiologische Grundelagen für Bau und Einsatz von Stratosphärenflugzeugen". Schriften der deutschen Akademie der Luftfahrtforschung.* It is a survey of research in aviation medicine and findings of the effect on man of flight at high altitudes, in climbs and in sudden drops, and of the protective measures worked out to ameliorate or remove such conditions. He discusses open altitude flight with oxygen breathing up to 12,000 metres, flight above 12,000 metres without pressure cabins, aeroembolism, ventilation of pressure cabins, dilution of oxygen as a result of pressure drop, parachute jumping with oxygen flasks, drop in air pressure and the behaviour of gas-filled hollow organs. He reaches the conclusion that none of the altitude effects up to 17,000 metres are so serious that there is no time for the technical use of emergency measures. A discussion of the anatomical finding of Drs. Roessle, Weltz and Luft is appended. Photographs, graphs, tables and charts are included.

PB 27317. BURTON, A. C. *Kaiser-Wilhelm-Institut für Arbeitsphysiologie* (physiology of exercise and application to industry, particularly mining). (BIOS Final Rept. 83, Item 24). Sept., 1945. 38 pp. Price: Microfilm, $1.00; Photostat, $3.00.

The principal interests of the institute, according to this report, have been the physiological efficiency of the workman at his work in relation to his industrial output, and the effects upon it of the type of work, working conditions, nutrition, and physiological factors. Findings of the institute, laboratory, equipment and methods are outlined. A description of its activities, including a financial statement, is given in Appendix 1. It is largely supported by the mining industry. A summary statement prepared to convince the occupation authorities that the institute should be reestablished and a complete list of papers published by the institute in the last years are given in Appendices 2 and 3.

PB 1696. Reprints and original articles; medical faculty, University of Tübingen. 360 pp. Price: Microfilm, $4.00; Photostat, $24.00.

This report is taken from a microfilm roll containing one original typewritten article and 26 reprints picked by the United States Army from the files of the Medical Faculty of Tübingen University. The subjects covered in these papers include gynæcology, ophthalmology, urology, endocrinology, communicable diseases, water pollution and sulphonamide therapy. The individual articles listed are as follows: 1. Mayer, August. Typewritten manuscript, untitled, evidently the outline of a projected longer article on various phases of gynæcology. Much of this is illegible. No date. 5 pp. 2. Clauberg, K. W., and Tarnowski, G. *Über den Wert der aktiven Scharlachschutzimpfung.* (Value of active inoculation against scarlet fever.) *Deutsches Ärzteblatt*, Hft. 12, 226 (Dec. 1, 1944). 2 pp. (1 page missing). 3. Stickl, O., and Gärtner, K. *Untersuchungen über die Wirksamkeit von Sulfonamiden auf die normale und pathogene Darmbakterienflora.* (Studies of effect of sulphonamides on normal and pathogenic intestinal bacterial flora.) *Zeitschrift für Hygiene und Infektionskrankheiten*, 123, 591 (1942). 25 pp. 4. Gärtner, Kurt. *Vergleichende Untersuchungen zur Schnelldiagnose von Bacterium coli im Trinkwasser.* (Comparative studies on rapid diagnosis of *Bacterium coli* in drinking water.) *Ibid.*, 122, 661 (1940). 16 pp. 5. Gärtner, K. *Die Brauchbarkeit und Empfindlichkeit einer Indolgärungsmethode im Verein mit der Bulirschen Probe zur bakteriologischen Trinkwasseruntersuchung.* (Value and sensitivity of an indole fermentation method in combination with the Bulir test for bacteriological analysis of drinking water.) *Ibid.*, 123, 6 (1940). 12 pp. 6. Stickl, O., and Gärtner, K. *Die Wirkung der Sulfonamidbehandlung während einer Typhus-epidemie.* (Effect of sulphonamide therapy in a typhoid epidemic.) *Münchener medizinische Wochenschrift*, 91, 441 (1944). 4 pp. 7. Murthum, J., and Glenk, M. *Die Sulfonamidwirkung auf Bakterientoxine im Tierversuch.* (Effect of sulphonamides on bacterial toxins in animal experimentation.) *Klinische Wochenschrift*, 23, 316 (1944). 3 pp. 8. Stickl, O., and Gärtner, K. *Aussichten der Sulfonamidbehandlung der Ruhr auf Grund experimenteller Untersuchungen.* (Expectations for treatment of dysentery, with sulphonamides upon the basis of experimental investigations.) *Deutsche medizinische Wochenschrift*, 68, 509 (1942). 7 pp. 9. Gärtner, K. *Die sichtbare Beeinflussung der Krankheitserreger in vitro durch Sulfonamide Pathogenie.* (The visible effect of sulphonamide on bacteria *in vitro*. *Ibid.*, 70, 336 (1944). 7 pp. 10. Stickl, O., and Gärtner, K. *Die Wirkungsweise der Sulfonamide und ihre chemotherapeutische Anwendung bei Ruhr.* (Mode of action of sulphonamides and their chemotherapeutic application in dysentery.) *Zeitschrift für Hygiene und Infektionskrankheiten, 125, 226 (1943).* 40 pp. 11. Usadel, W. *Der physikalische Vorgang bei den "Glückschüssen" des Bauches.* (Physical processes involved in so-called "fortunate gunshot wounds" of the abdomen.) *Deutsche Zeitschrift für Chirurgie*, 257, 455 (1943). 8 pp. 12. Usadel, W. *Die Operationstechnik.* (Surgical technique.) *Chirurgie*, 1, 417 (2nd ed., 1940). 47 pp. 13. Usadel, W. *Die Aseptik und die Antiseptik in der Chirurgie.* (Asepsis and antisepsis in surgery.) *Ibid.*, 1, 393 (2nd ed., 1940). 25 pp. 14. Stock, W. *Über die chronische Uveitis, ihre Ætiologie und Behandlung.* (Ætiology and therapy of chronic uveitis.) *Klinische Monatsblätter für Augenheilkunde*, 108, 257 (1942). 6 pp. 15. Fassbind-Knapp, D. *Zusammenfassende Übersicht über Technik und Resultate der chemischen Hornhauttätowierung.* (Comprehensive survey of techniques employed and results obtained in chemical tattooing of cornea.) *Ibid.*, 108, 262 (1942). 11 pp. 16. Bennhold, H. *Die Therapie des Cushing-Syndroms.* (Therapy of Cushing's syndrome.) *Wiener Archiv für innere Medizin*, 35, 101 (1941). 27 pp. 17. Borgard, W. *Über Ursachen und Bedeutung flüchtiger Nierenbeckenentleerungsstörungen.* (Causes and significance of transitory disturbances in the emptying mechanism of the renal pelvis.) *Münchener medizinische Wochenschrift*, 91, 143 (1944). 12 pp. 18. Borgard, W. *Bedeutung und Erkennung atypisch Verlaufender Nierengefässe.* (Significance and recognition of aberrant renal vessels.) *Zeitschrift für Urologie, Chirurgie und Gynäkologie*, 47, 1 (1944). 21 pp. 19. Borgard, W. *Intravenöse oder transvesikale Pyeloskopie?* (Intravenous *versus* transvesical pyeloscopy.) *Zeitschrift für Urologie*, 36, 307 (1942). 4 pp. 20. Borgard, W. *Über die Beurteilung der Blasenschwäche im Kriege.* (Examination into bladder weaknesses during war.) *Münchener medizinische Wochenschrift*, 89, 488 (1942). 7 pp. 21. Borgard, W. *Zur Kenntnis der pyelogenen Herdinfektion.* (Pyelogenic focal infections.) *Zeitschrift für Urologie*, 37, 202 (1943). 7 pp. 22. Borgard, W. *Nachweis und Beurteilung von Spasmen an den Harnableitenden Wegen.* (Detection and evaluation of spasms in the efferent urinary passages.) *Ibid.*, 36, 281 (1942). 9 pp. 23. Borgard, W. *Zur Beurteilung der Sphinkterinsuffizienz.* (Diagnosis of sphincteric insufficiency.) *Ibid.*, 37, 75 (1943). 8 pp. 24. Borgard, W. *Über die Beurteilung des Harnleiterabgangs im Röntgenbild.* (Rœntgenographic examination of the starting point of the urethra.) *Ibid.*, 37, 231 (1943). 14 pp. 25. Borgard, W. *Über Wierenharnleiterkoliken.* (Renal-ureteral colic.) *Chirurg*, 14, 717 (1942). 9 pp. 26. Gärtner, K. *Die Sulfonamidwirkung im Lichte der Fluoreszenz- und Elektronenmikroskopie.* (Fluorescence and electron microscopy as applied to the action of sulphonamide. *Zentralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten.* (I. Abt., Orig.) 150, 97 (1943). 23 pp.

PB 22446. KLEIDERER, E. C., *et alii. I. G. Farbenindustrie*, Behringwerke, Marburg A/L. (FIAT Evaluation Rept. 1062; FIAT Final Rept. 73.) July, 1945. 2 pp. Price: Microfilm, 50c.; Photostat, $1.00.

This report describes the results of the interrogation of Dr. Bieling and Dr. Schmidt. Dr. Bieling described his method of testing dibromo salicyl against *Rickettsia prowazeki*, the cause of louse-borne exanthematic typhus fever. In preliminary tests he found that as little as 0·5 milligramme of dibromo salicyl prevented a local reaction with a heavy dose of rickettsia. The beneficial effects of nitro acridin in mice infected with *Rickettsia prowazeki mooseri* were demonstrated. Very good results were also obtained with this drug when used on men suffering from trench fever, *Rickettsia quintana wolhynica* Dr. Schmidt, when interrogated, revealed that he was working on the isolation of substances from body secretions which are responsible for the agglutination of blood. At present he is chiefly interested in obtaining an anti-agglutinin for Group O for use in forensic medicine in paternity suits.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on August 22, 1946, at the Lewisham Hospital, Lewisham. The meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the hospital.

Herpes Zoster with Associated Muscle Paralysis.

DR. L. J. WOODLAND'S first patient was a female, aged fifty-eight years, who when first examined on June 1, 1946, said that about six and a half months previously she had developed a rash over the left shoulder, the lateral aspect of the left arm, the dorsum of the left hand and the first, second and fourth digits. The rash was preceded and followed by pain over the left side of the neck and in the left interscapular region. The rash, which was diagnosed as *herpes zoster*, disappeared in a few weeks. Ever since the onset of symptoms the patient had noted weakness of the left shoulder.

On examination of the patient, patchy pigmentation was present over the left suprascapular region, the deltoid region, the antero-lateral aspect of the arm and the anterior aspect of the forearm in the mid-line. Considerable wasting of the left deltoid muscle had occurred. A full range of abduction was possible, as the posterior fibres of the deltoid were not noticeably affected. The deltoid muscle was rested in a shoulder abduction splint and graduated exercises were commenced. After two months' treatment the mass and power of the deltoid had increased.

Dr. Woodland said that he considered the distribution of the rash suggested involvement of the fifth, sixth and seventh nerve roots. The motor involvement affected only the deltoid muscle, mainly the anterior and middle fibres.

Perthes's Disease.

Dr. Woodland's second patient, a female, aged eight years, was first examined in October, 1943; she gave a history of a dull, aching pain in the left groin of five days' duration, first noticed after she had played hopscotch. The pain was constant, was increased by movement and was becoming worse. On examination, the child was seen to be a healthy, plump girl. She complained of tenderness on pressure in the left groin. Movement of the left hip was slightly limited in all directions, and she complained of pain at the extreme of all movements. Her temperature was 99·6° F. As the child's symptoms did not decrease, and as some "starting pains" occurred, she was admitted to hospital ten days after the onset of symptoms. Traction with five pounds' weight was applied to the left lower limb with complete relief of pain. For three weeks her temperature varied from 99° to 100° F. The leucocytes numbered 12,500 per cubic millimetre, 46% being neutrophile cells, 2% eosinophile cells, 49% lymphocytes and 3% monocytes. The Mantoux test produced no reaction. X-ray examination of the left hip revealed no abnormality until five weeks after the onset of symptoms, when early fragmentation with slight flattening of the capital epiphysis was noted. Many months later slight broadening of the neck of the femur was seen. The child was treated by traction in a Jones's abduction frame for two years, and then in a Thomas hip splint for six months.

Dr. Woodland pointed out that in this case the symptoms closely mimicked tuberculous disease of the hip. Pain, muscle spasm, limitation of movement in all directions, slight pyrexia, leucocytosis with relative lymphocytosis and a normal X-ray picture were more characteristic of early tuberculosis than of Perthes's disease. The negative response to the Mantoux test, combined with characteristic if mild later X-ray findings, established the diagnosis of Perthes's disease. Usually in children suffering from early Perthes's disease, the changes seen on X-ray examination were pronounced as soon as symptoms occurred, whereas in children with early tuberculous hip disease, the clinical findings were more pronounced than the X-ray findings. Dr. Woodland also mentioned that in spite of early and adequate immobilization before any changes were seen in the X-ray film, after three years it was possible to tell on X-ray examination that the child had had Perthes's disease. Minimal flattening of the femoral head with slight broadening of the neck was still present.

Malignant Tenosynovioma.

Dr. Woodland's next patient was a male, aged three years, who had been under treatment for mild residual paralysis of the left lower limb following an attack of acute anterior poliomyelitis six months previously. On March 1, 1946, whilst the left foot was being examined, a tumour measuring about two inches by one inch by one inch was felt on the sole of the foot beneath the mid-tarsal joint. The tumour appeared to be soft, mobile and circumscribed, situated beneath the plantar fascia; it was thought to be a subfascial lipoma. At operation on March 26 the tumour was found to be deep to and adherent to the plantar fascia. Greyish, gelatinous digitations of the tumour extended distally along the tendon sheaths of all the toes except the little toe for about two inches. The tumour similarly extended proximally around the tendons of the *flexor digitorum longus* and the *flexor hallucis longus* to the level of the medial malleolus. The tumour together with tendons was removed. Clinically the tumour appeared to be a malignant tenosynovioma. Dr. Woodland said that Dr. G. F. S. Davies had examined the tumour and reported in the following terms:

> The tumour is a highly cellular one, and the cells are grouped in alveoli, but do not fill them. They tend to be adherent indirectly or by filament. Some of the cells form small giant cells. Where voluntary muscle is present, appearances suggest that invasion is taking place. This and the hyperchromatic appearance of the tumour cells would suggest that it is malignant. The exact site of origin cannot be told on examination of the sections. The possibility of origin from tendon sheaths appears likely. I can find no evidence of bone formation.

Three weeks after operation enlarged glands were palpable in the left inguinal region. A course of deep X-ray therapy was given to the left foot and the left inguinal region, after which the enlarged inguinal glands decreased considerably in size. The parents declined to allow any operative removal of glands or amputation.

Dr. Woodland pointed out that the pathology of synovioma was characterized by the diversity of cell forms. In the more common benign type, apart from the basic synovial cell, which was a modified connective tissue cell, fibrous tissue, cartilage, foam cells, gland cells, fatty tissues and even bone cells were not uncommonly found. The term "sarcoma" was properly applied to the malignant type of tenosynovioma in view of the cell origin. Malignant synoviomata tended to recur locally and to metastasize readily to regional lymphatics.

Osteogenesis Imperfecta.

Dr. Woodland finally showed a female patient, aged nine years, who had sustained about 25 fractures since he had first examined her at the age of three years. These fractures had occurred in metatarsals, phalanges of fingers, tibia, fibula, occipital bone, humerus and scapula. At the time of the meeting she had a fracture of her left cuboid bone. As was usual in *fragilitas ossium*, the fractures had united readily, and as each fracture had been treated by adequate support, no deformities had resulted. The child's mother had blue sclerotics and otosclerosis. The child's maternal grandfather had blue sclerotics but was not deaf.

Dr. Woodland pointed out that this child illustrated all the features of the adolescent type of the disease: (i) blueness of the sclerotics, which was a more dominant character than brittleness; (ii) the characteristic shape of the head with bulgings at the occipital and parietal eminences, which caused the face to appear to be small and triangular; (iii) hypotonia of muscle, which had led to postural defects—for example, valgoid feet, mild knock-knee and bad spinal posture; (iv) fragility of the bones, which had predisposed the patient to multiple fractures, mainly subperiosteal crack fractures; (v) abnormal transradiancy of bone with many cross striations in long bones, revealed by X-ray examination. Flattening of the top of the skull with bulgings at the parietal and occipital eminences had caused an increase in the transverse diameter of the skull. Dr. Woodland said that it could be expected that fractures would occur infrequently after the age of sixteen years. As the shafts of bones tended to sclerose at about that age, so in about one-third of cases otosclerosis began to develop.

Urological Exhibit.

DR. R. G. S. HARRIS first showed X-ray films from a case of dumb-bell-shaped calculus in a dilated and dependent lower renal calyx. The rest of the calical system was normal. In view of the poor drainage from this calyx, it was decided to perform a partial nephrectomy or calicectomy. The lower third of the kidney was completely removed. An excretion urogram taken three months later showed that the kidney was functioning normally.

Dr. Harris then showed a series of pathological specimens and X-ray films demonstrating primary tumours of the

renal pelvis and of the upper portion of the ureter. Two of the patients had had multiple papillomata of the bladder, which had been treated by endoscopic application of the high-frequency current over a number of years. In neither case was an early investigation of the upper part of the urinary tract carried out. When this was eventually made, a non-functioning kidney was found and subsequently removed. In each case a papillary tumour of the renal pelvis was found.

Dr. Harris then discussed a recent case of papillary tumour obscuring the left ureteric orifice, a non-functioning kidney being present on the left side. Hæmaturia was of only six weeks' duration, and pain of only four weeks' duration. Nephrectomy was performed, and a papillary carcinoma of the uretero-pelvic junction was found, with extension of the tumour through the ureter. Dr. Harris said that secondary ureterectomy with excision of the tumour-bearing portion of the bladder was to be undertaken later.

Dr. Harris remarked that the cases discussed illustrated the importance of early investigation of hæmaturia, and the necessity for routine investigation of the upper part of the urinary tract when papillomata of the bladder were found.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held on August 14, 1946, at the Children's Hospital, Melbourne, DR. A. P. DERHAM, the Chairman, in the chair. Parts of this report appeared in the issues of February 1 and February 8, 1947.

A Case for Diagnosis.

DR. A. P. DERHAM showed a girl, aged nine years, who had been admitted to the hospital on May 4, 1946, suffering from lassitude, loss of weight and cough with a considerable amount of sputum dating from an attack of "bronchitis" in December, 1945. She had also had excessive sweating, especially of the hands, and she had passed loose, semi-formed, pale yellow stools between two and five times in twenty-four hours. There had been occasional vomiting, but no hæmoptysis. A more searching inquiry from the child's father, who had come down from the country in the previous week, elicited the statement that her birth was normal, that she had been breast fed for seven months, and that she had been constipated for the first twelve months of her life at least. At the age of about two years she had begun to have periodic attacks of diarrhœa, passing pale yellow, semi-formed motions four or five times a day and usually once at night. During these attacks she had been listless, flushed and feverish and had sweated excessively. From this time onwards she had been noticed to have an excessively protuberant abdomen. The attacks had recurred three or four times a year and seemed to be precipitated by excitement or worry rather than by dietetic errors; they had been more frequent in recent years. She disliked eggs, but had usually shown no distaste for fat. The family history seemed unimportant. Her mother suffered from hay fever. Her father was well and denied the possibility of venereal disease. She had one sister, aged two years, who was in good health. The patient had been immunized against diphtheria in 1943, and had had a series of injections of pertussis vaccine in December, 1945, during the course of her bronchitis. She had been a contact at fairly frequent intervals with a woman who was probably suffering from "open" pulmonary tuberculosis.

On her admission to hospital the child was pale, wasted and bright-eyed, with slightly flushed cheeks. Her lips were slightly cyanosed and she looked ill. Her temperature was 100° F., her pulse rate was 128 per minute, and her respirations numbered 40 per minute. Her tongue was moist and coated with a white fur. Examination of her eyes, ears, gums, naso-pharynx and fauces revealed no abnormality. Examination of her heart and central nervous system revealed no abnormalities, except that the tendon reflexes were less active than normal. Examination of the lungs revealed symmetrical expansion of the chest. Percussion revealed patchy areas of relative dulness, especially at the apex of the right lung and the base of the left lung posteriorly. Auscultation revealed coarse râles over the whole of both lung fields, with diminished vesicular murmur and crepitations corresponding to the areas of dulness. The abdomen was protuberant and the liver was palpable three fingers' breadth below the right costal margin; the left lobe seemed to be enlarged, and the whole organ was nodular. The spleen at that time was not palpable, although it later became enlarged to the extent of one and a half fingers' breadth below the costal margin, only to recede again. No abnormal mass was palpable and no free fluid was demonstrated at this stage in the abdomen. The superficial lymphatic glands were not abnormally enlarged or tender. There were signs of early clubbing of the fingers. The urine at this stage was normal and contained no bile pigments. A provisional diagnosis of generalized tuberculosis was made, and certain tests were instituted, with the following results. The Mantoux test produced a negative response with 1:1,000 and later with 1:100 tuberculin. The tuberculin skin patch test at first produced a doubtful response, later a negative response. The Wassermann test produced at first a doubtful response and later a negative response. The response to the Casoni test, both immediate and delayed, was negative. Sputum and fluid obtained from gastric lavage was examined; no tubercle bacilli were found in either on examination of a direct smear or attempted culture. An X-ray examination of the lungs was made on May 6; Dr. Colin Macdonald reported that the appearances suggested widespread broncho-pneumonia; a tuberculous basis could not be excluded, though the appearances were not those of miliary tuberculosis. Examination of the blood on May 4 gave the following information: the hæmoglobin value was 98%, the erythrocytes numbered 4,610,000 per cubic millimetre, the leucocytes numbered 22,900 per cubic millimetre; of the leucocytes, 68% were polymorphonuclear cells, 20% were lymphocytes, 10% were monocytes, 1% were eosinophile cells and 1% basophile cells. No abnormality was observed in the red blood corpuscles or thrombocytes. Further X-ray examinations of the lungs on May 15 and on June 21 revealed little if any change; but later X-ray films revealed signs of patchy consolidation consistent with the clinical changes observed during several exacerbations of pulmonary inflammation, bronchopneumonia or pneumonitis, which occurred and were controlled by sulphamerazine or penicillin therapy, or by the two in combination.

Dr. Derham said that the child continued to pass semi-formed, pale yellow or grey stools; but these were not usually abnormally frequent. Examination of the fæces for fat on June 6 showed that the fat content of the dried fæces was 43·3%, of which 67·6% was split and 32·4% was unsplit; the normal figures were less than 30% for the total fat content, of which approximately 75% was split. Successive blood examinations revealed a gradual reduction of the hæmoglobin value to 80% on July 17 and in the number of leucocytes to 11,100 per cubic millimetre, but otherwise no significant change. Her weight on June 19 was three stone four and a half pounds, on June 27 it was three stone six and a half pounds, and on July 3 it was three stone five and a half pounds.

Dr. Derham went on to say that the treatment on the child's admission to hospital was isolation, rest, a full diet, sulphamerazine and penicillin in full doses for her broncho-pneumonia. Her general condition and appearance improved considerably. On May 21 she was seen in consultation by Dr. J. W. Grieve, who postulated an abdominal neoplasm with metastases in the liver complicated by a bilateral diffuse bronchiectasis. This seemed the most probable diagnosis. Early in July, however, certain features of the case, particularly the X-ray appearances of the lungs, suggested to one of Dr. Derham's post-graduate student colleagues the possibility that the condition was one of sarcoidosis (Besnier-Boeck-Schaumann's disease). In view of this idea, an inguinal lymph gland was excised under local anæsthesia and microscopically examined with negative results. The bones of the hands were radiologically examined and found to be normal. Arrangements were made to obtain a biopsy of liver tissue by liver puncture; but the blood clotting time was found to be prolonged, and a course of parenteral injections of vitamin *K* had been commenced. Early in July also the enlargement of the liver had continued to increase, free fluid was present in the abdomen, and large dilated superficial abdominal vessels were observed over the diaphragmatic area. The spleen also was easily palpable. Except for the history and the pulmonary abnormality, the condition in some ways resembled the general picture of Banti's syndrome. In view of the increasing signs of portal obstruction, and of the fact that sarcoidosis was sometimes amenable to deep X-ray therapy, the child was submitted to a course of eight daily doses of deep X-ray treatment (200 kilovolts) by Dr. Kaye Scott at the Central Hospital, with short exposures spread over ten days. The dosage consisted of 150*r* applied over a field measuring 15 by 10 centimetres over the portal area of the liver, with the long axis parallel to its lower border. A filter of 0·5 millimetre of copper and 1·0 millimetre of

aluminium was used. After this, but not certainly as a result of this, the abdominal vessels returned almost to normal and the amount of free fluid in the abdomen was considerably reduced.

Unfortunately, shortly after the end of this treatment, on July 29, she suffered a severe relapse of the bronchopneumonia, with an evening rise of temperature up to 105° F., which did not respond to sulphamerazine therapy. This was replaced by three-hourly parenteral injections of 10,000 units of penicillin. Intensive penicillin therapy was followed by improvement in her general condition, a fall in temperature to within normal limits and signs of resolution of the areas of consolidation in her lungs. Her urine had recently shown traces of blood by the benzidine test, but this had not been confirmed by microscopic examination. Significant amounts of glycosuria had also been detected by Benedict's test, but these had not been constant, and a blood sugar estimation had not been made. At the time of the meeting her liver was reduced in size possibly to one finger's breadth less than the previous maximum size, and the spleen was just palpable on deep inspiration. Her abdomen was distended, but not tense, and no free peritoneal fluid could be demonstrated. Her superficial abdominal vessels were within normal limits. The urinary diastase was 3·3 units per millilitre of urine.

In discussing the diagnosis, Dr. Derham said that the provisional diagnosis of generalized tuberculosis on her admission to hospital seemed to be ruled out by the complete absence of positive evidence of tuberculosis; but it had to be remembered that the latest opinion expressed in *Medical Clinics of North America* was that sarcoidosis was an atypical form of tuberculosis. The diagnosis of neoplasm seemed now to be unlikely owing to the time factor, and particularly since it had been established that some of her major symptoms had commenced at the age of two years. The diagnosis of sarcoidosis was still tenable, although this disease was rare in children and hepatomegaly was not usually a prominent sign; moreover, although the X-ray appearance of the lungs was consistent with sarcoidosis, it was unusual for patients suffering from this condition to have a cough or sputum. X-ray therapy had been instituted because it was the only known treatment for any of the conditions possibly present, particularly sarcoidosis. In view of the nature of the stools and the probable coexistence of diffuse bronchiectasis, the most probable diagnosis now seemed to be fibrocystic disease of the pancreas. This probability had been considerably strengthened by the reexamination of the history, the date of onset of fatty stools being fixed at two years of age instead of eight and a half years, as had previously been reported. Dr. Derham finally emphasized that he had presented the case, not for its educational value, but because the child's life was obviously at stake, and he hoped for assistance from members who might have had experience of similar problems in the past.

DR. H. DOUGLAS STEPHENS said that he did not feel qualified to express an opinion. He thought the child had bronchiectasis. He had not seen amyloid disease since the old osteomyelitis days.

DR. ALAN PENINGTON said that he had seen three cases of amyloidosis in three cases of pulmonary tuberculosis. On looking at the X-ray films, he thought there was a chance that the condition was bilateral bronchiectasis and lardaceous disease with hepatosplenomegaly and ascites. He suggested that a bronchoscopic examination be carried out and an X-ray film taken after the instillation of lipiodol. Peritoneoscopy might be considered as an aid to diagnosis, or a laparotomy might be performed.

DR. KATE CAMPBELL suggested that the abnormality might be primarily pancreatic. A fat percentage of 43 in the dried fæces when the patient was receiving a diet poor in fat was significant. A case had been reported in a recent issue of the *British Medical Journal* of a family of children, all of whom had hepatosplenomegaly associated with blood incompatibility in the parents. In this case Dr. Campbell believed that hepatic and pancreatic disorders were associated and that the lung condition was secondary. She thought it would be interesting to investigate the family blood groups and to see if they were compatible.

DR. ROBERT SOUTHBY said that he felt that the chest condition was secondary. He thought that the child's condition might have started as cirrhosis. He agreed with Dr. Campbell that Rh testing would be worth while.

DR. MOSTYN POWELL suggested that the urine be examined for amyloid casts.

Dr. Derham, in reply, said that he had been most impressed by the suggestion of a primary pancreatic pathology. The child had been too ill for bronchoscopic and lipiodol examination. Laparotomy had been thought of early in the course of the disease, but the alternative suggestion of liver puncture was thought to be safer. Laparotomy, however, would be justifiable if these investigations proved to be inconclusive.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

ANNOUNCEMENTS.

THE Post-Graduate Committee in Medicine in the University of Sydney desires to make the following announcements.

Courses.

The following courses are in progress and will be completed by April 3: (i) course in advanced medicine suitable for M.R.A.C.P. examination candidates; (ii) courses for Part II of the examinations for the degree of Master of Surgery and for the Diplomas in Laryngology, Oto-rhinology and Ophthalmology; (iii) course for general practitioners, which is made up as follows: gynæcology, March 3 to 7; obstetrics, March 10 to 21; pædiatrics, March 24 to April 3. Courses for Parts I and II of the examination for the Diploma in Psychological Medicine are also in progress until November.

Courses pending include the following: courses for the Diplomas in Anæsthesia, Dermatology (Part I), Diagnostic Radiology and Therapeutic Radiology beginning on March 24; a course for general practitioners beginning on April 14; course in advanced medicine and course for Part II of the Diploma in Dermatology beginning on June 9. During Trinity Term a course for the Diploma in Clinical Pathology will begin. Further courses for general practitioners will be held during this term if necessary. On September 1, courses will begin for Part I of the examinations for the degree of Master of Surgery and for the Diplomas in Gynæcology and Obstetrics, Laryngology, Oto-rhinology, Ophthalmology and Psychological Medicine.

All courses are open to medical practitioners, and early application is essential. The committee reserves the right to limit the number of enrolments in any course.

Annual General Course.

The annual general course includes attendance at all regular monthly film showings, winter lectures, occasional lectures *et cetera* held throughout the year. The subscription is £1 1s. *per annum*.

Sir William Fletcher Shaw, visiting examiner for the membership examination of the Royal College of Obstetricians and Gynæcologists, will give a lecture on "Pre-operative Preparation" on Wednesday, March 12, at 8 p.m., in the Stawell Hall, 145, Macquarie Street, Sydney.

Films.

Films will be shown at 4.30 p.m. in the Stawell Hall, 145, Macquarie Street, Sydney, on the following dates: March 19, April 16, May 21, June 18, July 23, August 20, September 17, October 22 and November 19. The committee has instituted a film library and now has about forty films. This number should be doubled within the next two months. Films are available on loan to authorized bodies, and arrangements may also be made for films to be viewed on request by members of the annual general course or other courses. A catalogue of films is available on application. Forms for the loan of medical films are also obtainable.

The following films have lately been added to the library: "Cardiac Arrest", "Handling and Care of the Patient", "Gas Absorption Technique", "Inguinal Hernia, Clinical Aspect", "Infections of the Hand", "Intravenous Anæsthesia" (Parts I and II), "Spinal Anæsthesia", "Endotracheal Anæsthesia", "Continuous Flow Anæsthesia", "Open Drop Ether" and "Effect of Metallic Ions on the Heart".

Country Courses.

Country courses will be held this year as follows: Armidale, March 8 and 9; Katoomba, March 15 and 16; Albury, May 3 and 4; Broken Hill, June 14 and 15; Lismore, August 2 and 3; Wollongong, September 20 and 21; Parramatta, October 18 and 19; Newcastle, October 25 and 26. Courses will also be held at Wagga Wagga, Kempsey and Orange, the dates of which will be announced later.

Correspondence Courses.

The fee for the correspondence course for general practitioners is £5 5s. Other courses, which are open to active and demobilized medical officers only, will cease on December 31, 1947.

Bulletin of the Post-Graduate Committee in Medicine, University of Sydney.

The committee publishes a monthly bulletin, which consists of lectures given under its auspices. The subscription is £1 1s. *per annum.*

Medical Officers Proceeding Overseas.

All medical officers from New South Wales proceeding to London are asked to consult the committee, so that arrangements may be made with the British Post-Graduate Medical Federation in London before they leave Australia.

Particulars of Activities.

All particulars concerning the foregoing activities may be obtained from the office of the Post-Graduate Committee in Medicine, 131, Macquarie Street, Sydney (telephones: BW 7483, B 4606).

POST-GRADUATE COMMITTEE IN MEDICINE, UNIVERSITY OF ADELAIDE.

Refresher Week Course for General Practitioners.

THE Post-Graduate Committee in Medicine, University of Adelaide, will hold a week's course in refresher medicine from Monday, August 25, to Sunday, August 31, 1947, inclusive.

The course has been designed to deal with conditions encountered by all general practitioners, and will cover medicine, surgery, gynæcology, obstetrics and pædiatrics. The last two days of the course, Saturday and Sunday, will be occupied by the annual week-end course in surgery, the subject to be dealt with being "Fractures".

A detailed programme will be published at a later date.

Correspondence.

ASTHMA AND SOME PSYCHOPHYSICAL INTERRELATIONS.

SIR: I would like to congratulate Dr. Cedric Swanton on his paper entitled: "Asthma and some Psychophysical Interrelations" (February 1, 1947). His avoidance of esoteric language and reference to physiological principles probably appealed to many who would not ordinarily have read an article on a psychiatric subject, and helped to show that psychiatry can no more be studied apart from general medicine than the living human individual can be isolated and understood without reference to his milieu.

An asthmatic attack sometimes gives the impression of a state of rage, in arrest, but with the respiratory manifestations of the increase in parasympathetic tone predominant; while stuttering can also be related to a fraction of the picture of rage—Darwin observed that in that emotion the voice "sticks in the throat".

With regard to the kind of domination described, and the concept of "Organ Language", it is interesting that the words "oppressive" and "stuffy" have long been applied to any "atmosphere" which "stifles" one's spontaneous impulses to a more than reasonable extent. The constitutional factor in childhood asthma is apparently so marked in some cases that the disorder seems to occur, for example, in a reasonably free family setting, wherein neither parent seems to be expecting of the child a rate of progress and standard of conduct in excess of that which was accepted without apparent harm by a sibling of about the same intellectual capacity. With a little difference in the patient's genetic make-up, however, and personal standards rather more exacting (owing perhaps to exposure to a different environment at a critical stage in super-ego development), asthma seems sometimes to develop. However, I agree that anxious, over-protective, exacting domination is usually prominent, and that excessive respiratory tract secretion, with infective changes later, also seems to be related to the frustration and aggression following such domination. A particularly bad environment in this connexion is that in which the mother is immature and inconsistent, incapable of real maternal love for any length of time (for, like a young child, she would rather receive than give affection) and fundamentally hostile to the child, while over-compensating for that unworthy and disturbing feeling by anxious coddling. From time to time she feels that she is doing harm thereby, and consciously wanting to act for the best, stops over-protecting and impulsively demands performance from the child of a standard too high even for one who had been allowed to develop normally—with bitter criticism at the inevitable failure. The father in such a pattern is consistent, but authoritarian, rigid, formal, critical of weakness and intolerant of the feeblest aggression and insubordination in the child. At most times he is afraid to praise or unbend, for fear he will "spoil" the latter, who is further disturbed by the father's habit of ignoring nervousness, weakness, *et cetera,* only in his wife, and his unquestioning support of the inconsistent demands made by her on the child, for he cannot bear to regard her as wrong in any way, since any fault in her would reflect on his wisdom in choosing her—and that could not be! He is really insecure in himself, and criticizes in the child many attributes which he is striving to ignore in his own make-up.

Another family situation found is that of the consistently dominant and protective mother, weak father, and frustrated child. Father is allowed to escape to his friends, but his child cannot, and in any case, frequently has few. In some bronchospasmogenic families there seems to be a conscientious belief that children should be punished whenever they do not reach more than adult standards of perfection in certain respects. G. B. Shaw says: "Perfect truthfulness coupled with perfect obedience is quite a common condition of leaving a child unwhipped." Sometimes the child, through projection, becomes a symbol for the less decorous drives and desires of the parent, and is accordingly attacked with impulsive energy. Siblings of asthmatics who escape respiratory trouble are sometimes sullen and bullying, or are embittered and hypochondriacal. Others still seem to be obtaining relief by becoming replicas of a dominant parent, or in a creative artistic pursuit.

As Dr. Swanton remarks, the real concern felt by the parents is, when redirected, of help in effecting a readjustment. They are usually as unwitting of their poor parentcraft as that ancient writer of one of the Apocryphal books, Jesus the son of Sirach, who said: "An horse not broken becometh headstrong, and a child left to himself will be wilful. . . . Give him no liberty in his youth, and wink not at his follies. Bow down his neck while he is young, and beat him on the sides while he is a child, lest he wax stubborn . . ."; but who, nevertheless, had sufficient appreciation of psychosomatic principles to go on to say: "Death is better than a bitter life or continual sickness, . . . sorrow hath killed many, and there is no profit therein. Envy and wrath shorten the life, and carefulness bringeth age before the time. . . . Watching for riches consumeth the flesh, and the care thereof driveth away sleep."

The parents cannot always appreciate the folly of condemning stifling authoritarianism in totalitarian states, while setting it up in the home, or in the case of the father, of competing aggresively in the commercial field while putting down a less than normal attempt by his child at independence and initiative.

The point for physician and student is that it is unsound to defer taking serious notice of a patient of any age until tissue changes and physical signs have followed the physical expression of disturbed emotions. Too often an inarticulate appeal for help is met with apathy, or even derision, until concrete, palpable organic changes proclaim that the condition is at once difficult to reverse and respectable. In the case of asthma, the nature of the attack arouses earlier interest, but too often treatment along physical, palliative lines only. What is needed is an appreciation of total man in place of the concept of him as an isolated aggregation of organs, considered always as a member of a social group, integrated with it in a complex manner, and reacting to it, or to images of it, with his whole body. The study of tissue pathology is absorbing and important, but if the student hears of Virchow, he should also know something of Freud and Meyer. If we ask him to read Darwin, it should be not only his "Origin of Species", but also his "Expression of the Emotions in Man and Animals", and in his clinical years, we might recommend to him Cannon, Flanders Dunbar, and Weiss and English.

Lastly, might I add a plea for the less frequent use of diagnostic labels, or at least of labels without careful qualification. Parents fasten on a word in the manner of primitive people who believe that having named a phenomenon, they understand it; for they regard concrete nouns as integral parts of the objects they merely (to us) symbolize. An attempt to interpret an emotional disorder to a child's parent is sometimes interrupted with, "But give it a name, doctor"; a request compliance with which would

be an easy evasion of the problem for the doctor in many cases of psychosomatic illness, and an excuse for the avoidance of the thought and effort on the part of the parent so often necessary in the readjustment of a whole situation.

Yours etc.,

250 Waverley Road, East Malvern, S.E.5, Victoria.
February 9, 1947.

R. E. G. MACLEAN.

Obituary.

JOHN JONES.

WE regret to announce the death of Dr. John Jones, which occurred on February 14, 1947, at Melbourne.

HENRY PEET.

WE regret to announce the death of Dr. Henry Peet, which occurred on February 24, 1947, at Balgowlah, New South Wales.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Constance, Theodore Jack, M.B., B.S., 1936 (Univ. Melbourne), 113 Australian General Hospital, Concord.

The undermentioned, registered by the Medical Board of Victoria under the provisions of the *Medical Practitioner's Registration Act*, 1946, has applied for election as a member of the Victorian Branch of the British Medical Association:

Zieher, Roman, M.D. (Univ. Vienna), Omeo, Victoria.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Addison, Margaret Joan Wilton, M.B., B.S., 1946 (Univ. Sydney), 19, Hunter Road, Mosman.

Aird, Elizabeth, provisional registration, 1946 (Univ. Sydney), 10, Stewart Street, Eastwood.

Bateman, Thomas Patrick Gerard, M.B., B.S., 1940 (Univ. Sydney), 9, Richmond Avenue, Cremorne.

Blows, Elizabeth Beryl, M.B., B.S., 1942 (Univ. Sydney), 695, Anzac Parade, Maroubra.

Notice.

THE annual cricket match between medical men and dentists will be played at the Sydney Cricket Ground on Wednesday, March 12, 1947. Those wishing to play should communicate immediately with Dr. W. L. Calov, 157, Macquarie Street, Sydney.

Books Received.

"Women and Children First: An Outline of a Population Policy for Australia", by Victor H. Wallace, M.D. (Melbourne), F.R.C.S. (Edinburgh), with Forewords by Sir David Rivett, K.C.M.G., F.R.S., and G. L. Wood, M.A., Litt.D.; 1946. Melbourne: Geoffrey Cumberlege, Oxford University Press. 8½" × 5½", pp. 367. Price: 15s.

"The Human Approach, A Book for Medical Students", by Henry Yellowlees, O.B.E., M.D. (Glasgow), F.R.F.P.S. (Glasgow), F.R.C.P. (Edinburgh), F.R.C.P. (London), D.P.M. (London); 1946. London: J. & A. Churchill Ltd. 8½" × 5½", pp. 198. Price: 10s. 6d.

"The Doctor and Tomorrow; The Future of Medical Service in Australia", by Arthur E. Brown, M.B., B.Ch. (Cantab.), F.R.A.C.S.; 1946. Sydney: F. H. Johnston Publishing Co., Pty., Limited. 7¼" × 5", pp. 136. Price: 3s.

"Pegmen Tales", by Ella McFadyen, illustrated by Edwina Bell; 1946. 10" × 7½", pp. 150, with many illustrations, some in colour. Price: 8s. 6d.

"Allergy in Practice", by Samuel M. Feinberg, M.D., with the collaboration of Oren C. Durham and Carl A. Dragstedt, Ph.D., M.D.; Second Edition; 1946. Chicago: The Year Book Publishers, Inc. 9¼" × 6¼", pp. 856. Price: $10.50.

"Modern Management in Clinical Medicine", by F. Kenneth Albrecht, M.D.; 1946. London, Baillière, Tindall & Cox. 10½" × 7½", pp. 1247, with 235 illustrations. Price: 55s. net.

"Gray's Anatomy, Descriptive and Applied", edited by T. B. Johnston, C.B.E., M.D., and J. Whillis, M.D., M.S.; Twenty-Ninth Edition; 1946. London, New York, Toronto: Longmans, Green and Co. 10" × 6¾", pp. 1618, with 1,359 illustrations, 642 in colour. Price: 70s. net.

Diary for the Month.

MARCH 3.—Federal Council of the B.M.A. in Australia: Melbourne.
MARCH 4.—New South Wales Branch, B.M.A.: Executive and Finance Committee. Special Groups Committee.
MARCH 5.—Victorian Branch, B.M.A.: Branch Meeting.
MARCH 5.—Western Australian Branch, B.M.A.: Council Meeting.
MARCH 6.—New South Wales Branch, B.M.A.: Special Groups Committee.
MARCH 7.—Queensland Branch, B.M.A.: Branch Meeting.
MARCH 11.—Tasmanian Branch, B.M.A.: Ordinary Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Frendly Societes' Dspensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societis' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.